

FRONTISPIECE.



THE NEW
GARDENER'S DICTIONARY;
OR

Whole Art of Gardening,
FULLY AND ACCURATELY DISPLAYED;

CONTAINING

The most approved Methods of cultivating all Kinds of
TREES, PLANTS, and FLOWERS;

WITH

Ample Directions for performing all the Operations in GARDENING;

WHETHER THEY RELATE TO

I. The HOT-HOUSE,
II. The GREEN-HOUSE,
III. The SHRUBBERY,

IV. The KITCHEN-GARDEN,
V. The FLOWER-GARDEN, or
VI. The FRUIT-GARDEN.

According to the PRACTICE of the BEST MODERN GARDENERS,
Arranged under the ENGLISH proper Name of each Article.

By J O H N D I C K S,
GARDENER to his GRACE the DUKE OF KINGSTON;
Assisted by many EMINENT in the PROFESSION.

Nec vero segetibus solum, et pratis, et vineis, et arbusculis, res rusticae laetae sunt; sed etiam hortis et pomariis.
Cic. de Senect. 15



L O N D O N :

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1771.

ADVERTISEMENT.

IT is a pleasing employment for an ingenuous and benevolent mind to reflect on the various and valuable improvements that have been lately made in all the useful and practical arts; to compare their former with their present state; and to remark how the rays of genuine knowledge have gradually dissipated the mists of ignorance and error. Among these useful and practical arts, the practice of Gardening has had an ample share. That engaging and necessary employment has within a few years been carried to an amazing height; and new experiments and new discoveries are made almost every day to advance it still nearer to perfection.

But these discoveries and improvements having been made by a great variety of Gardeners, they are scattered in a number of books, and by that means, known only to those who have leisure to peruse, and abilities to purchase the many treatises in which they are contained.

The author of this Dictionary was therefore persuaded that he could not employ his leisure hours to more advantage than by forming a system of the most approved methods of cultivating all kinds of trees, plants, and flowers. This laborious task he has cheerfully undertaken, and that the reader may always know the writer to whom he is indebted for every improvement and discovery, that is not his own, the names of the authors from whom every particular is extracted, are added at the end of each article.

But though the principal intention of the author is to present the reader with a complete System of Gardening, in which he proposes to give every thing that is valuable from the best writers of different nations, yet he flatters himself that his own discoveries and improvements will not be considered as the least valuable part of this performance. Bred from his earliest years to the practice of Gardening and always desirous of improving that entertaining and useful art, it has been his constant practice to make remarks on the precepts delivered by the best writers on Gardening; to correct their errors, and supply their defects. By constantly persevering in this method, he has acquired a fund of materials and observations, which he would willingly hope, will prove of the greatest use to every lover of this delightful art.

At the same time he could not help observing, that the best writers on this subject, have omitted the most important particulars in the practice of Gardening; namely, the methods of performing the various operations necessary to be done in the hot-house, green-house, shrubbery, kitchen, fruit, and flower Gardens. These operations are indeed directed to be performed, but the manner how they are to be performed is left to the sagacity of the reader; the author of this work has therefore been very particular in describing the best methods of conducting these various operations, in order to render the practice of Gardening easy to be obtained.

A D V E R T I S E M E N T.

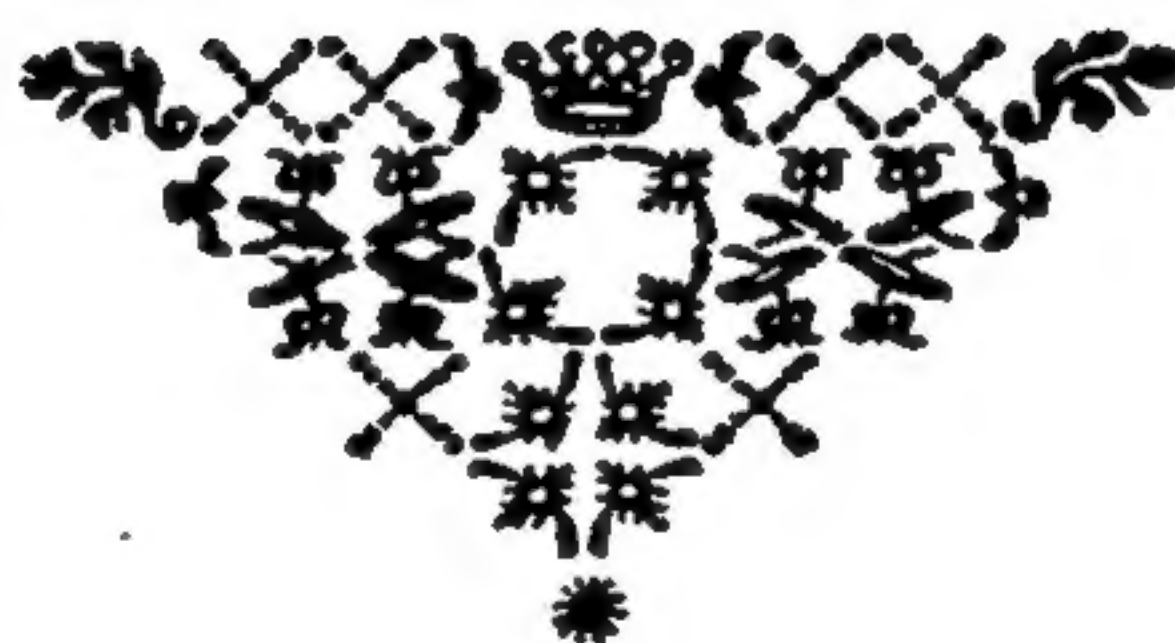
He has also by omitting a great number of useless particulars, and by carefully avoiding to repeat the same directions under different articles, reduced his work to about half the price, of the best Dictionary of Gardening yet extant in the English language. Though he flatters himself that it will be found to contain the whole art as now practised by the best Gardeners, besides a great variety of discoveries and improvements, made by himself and his friends during an interval of many years spent in assiduous observation.

The author also begs leave to observe, that this work has another advantage over every other performance of this kind in the English language: namely, in the copper-plates with which it will be illustrated. On these plates, a great variety of curious particulars will be delineated, and by that means, a more adequate idea will be conveyed to the reader than is possible to be done by verbal description only.

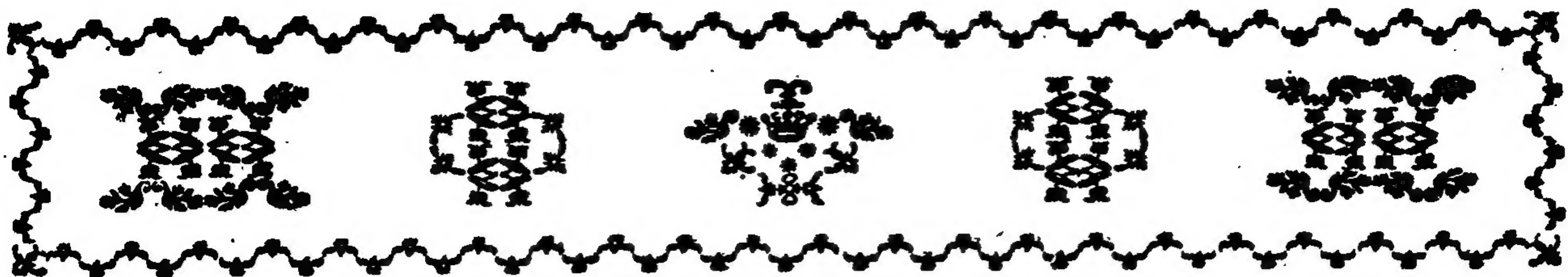
In a word, the author has sincerely laboured to render this work as useful as possible. In order to which neither pains nor expence have been spared. He has exerted his utmost abilities to make the delightful practice of Gardening easy and familiar, by removing every difficulty, and describing every operation in the plainest manner. The public will judge how well he has succeeded; and to their decision he cheerfully submits the merit of his labours.

Knightbridge,
Oct. 20, 1769.

J. D I C K S.

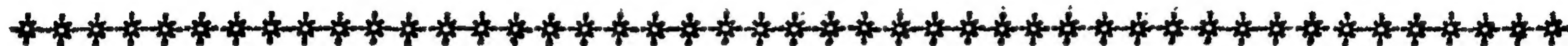


A N E W

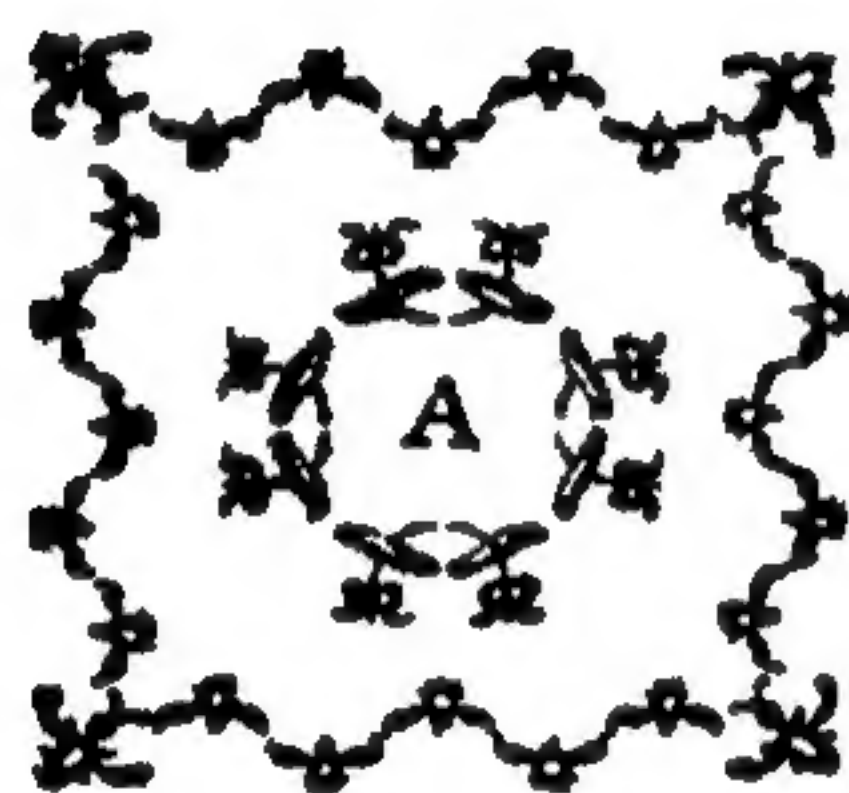


A N E W

GARDENER'S DICTIONARY.



A C A.



BELE-TREE, a species of the Poplar, (see the article **POPLAR**.) The leaves are large, and divided into four or five lobes, deeply indented on their edges, of a very dark colour on their upper side, but white and downy on the under, standing on foot-stalks about an inch long. The

male flowers or kat-kins, begin to appear about the beginning of April; they are cylindrical, scaly, and about three inches long; the female flowers, which appear soon after the male, have no stamina. The seeds are inclosed in a hairy covering, and are often waisted by the wind to a considerable distance.

The Abele-tree may be propagated by layers or cuttings in the month of February. The cuttings should be about three feet in length, and thrust about a foot and a half into the ground. The soil should be moist, if boggy the better; for they flourish best in watery places, and will become large trees in a few years. A very considerably advantage might therefore be made by planting these trees in waste places often overflowed with water, and which, on that account, produce very little profit to the owner.

ABLACTATION, a species of grafting much used by the ancients, and called by the modern gardeners grafting by approach. See the article **GRAFTING**.

ACACIA, *Egyptian thorn*, or *Binding Bean-tree*, a species of the Mimosa, or Sensitive Plant, according to Linnæus; but a distinct genera, according to other botanists. See the article **SENSITIVE PLANT**.

There are thirty-five species of this plant, which are all natives of the warmer climates, and therefore cannot be raised here without an artificial heat. Nor will they ripen their seeds in England; and therefore should be procured from the places where they flourish naturally.

These seeds should be sown on a hot-bed, or in pots filled with light rich earth, in the spring, and plunged into a bed of a moderate degree of heat; they will appear above ground, and when they are about three inches high, they should either be transplanted into a fresh hot-bed prepared for that purpose, or each into a separate pot, and again plunged into a hot-bed made of tanner's

bark; taking particular care to shade them from the rays of the sun till they have taken root; after which they should have fresh air admitted to them, by raising the glasses in proportion to the warmth of the season; care must also be taken, to water them gently, when the earth of the pots is dry; but they should have only a little at a time as they do not imbibe moisture very fast.

A sufficient quantity of air must be admitted to the plants as they advance in strength; and when the pots are filled with their roots they should be shifted into others of a larger size; but care should be taken that the pots are not too capacious, for they will not thrive in large pots; the earth should be light and sandy, for they will make but little progress, if the soil be stiff.

During the summer season, when the plants have acquired a sufficient degree of strength, they may be exposed to the open air; but this season rarely lasts longer than from the end of June to the end of August; during which time they should be placed in a warm situation and carefully defended from strong winds. Another circumstance necessary to be observed is to shift them when they are exposed to the open air that they may be well rooted before the cold comes on in the autumn, when they must be removed into the green-house. The most tender sort should be placed in a warm stove during the winter; for the air of the green-house will be too cold for them. But by keeping them in a moderate temperature of warmth they will succeed very well.

As these plants acquire strength, less care will be necessary; therefore as they advance in their growth, they should be gradually used to a colder air; but the gardener must be very careful not to give them too much water.

ACANACEOUS, an epithet applied to those plants which are prickly, and bear their flowers and seeds in a kind of heads.

ACANTHACEOUS, an epithet applied to all plants of the thistle kind, on account of the prickles with which they are beset.

ACANTHUS, *Bear's Breech*, the name of a genus of plants, placed by Linnæus in the dynamia class, and angiospermia order.

B

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There are four species of this genus; but the true *Acanthus* is called by authors *Acanthus mollis*, and *Acanthus Virgilii*; some *Branca Ursina*, but that name is less known: its proper title is *Acanthus foliis sinuosis inermibus*; by which it is distinguished from all other species.

It is a native of Greece and Italy; but will grow freely in good soils with us, without any particular care or culture.

The root is thick and full of fibres, the stalk fleshy, round, purplish or pale green, not much branched, and about a yard high. The leaves are long, and moderately broad; their colour is a fresh and lively green, with paler ribs; and they are waved and indented at the edges in a regular manner, and with unequalled beauty. The flowers adorn the top a foot in length, clustering along the stalk in a thick spike. Singly they are small; they are placed in a kind of triple cup, and are succeeded by a dry capsule.

In Italy the *Acanthus* flourishes in a deep soil, where there is water near, and where it is not quite destitute of shade. The gardener should therefore imitate these particulars so far as circumstances will permit. Let him chuse for his *Acanthus* the dampest part of his garden; let him dig the mould deep, and in the first week of March sow the seeds; they are best dropped at proper distances into shallow drills, and covered three quarters of an inch deep with mould.

Here they will shoot freely; and when risen the strongest plants should be marked, and the rest pulled up, that these may stand at a yard distance from each other. They will spread out their beautiful leaves into circular clusters, and flower late in the autumn.

ACAULOSE, without a stalk or stem; a name given by some writers to such plants as have no *caulis* or stalk.

ACHILLÆA, a genus of plants, ranged by Linnæus among the polygamia superflua syngenesia, and of which there are nineteen species, especially the purple tanzyleaved Achillæa.

The old authors were not unacquainted with this plant; Bauhine calls it small white flowered tanzyleaf, with a smell of camphire; But Tragus, with more propriety calls it, noble yarrow, and Morison, purple mountain yarrow with tanzyleaves.

Linnæus calls it Achillæa with leaves doubly pinnated the pinnæ distant and obtuse, and about seven pairs on each rib. The name is very expressive but culture varies the number and division of the leaves, though they keep in general the same form.

The root is long, thick, and hung with many fibres; it divides towards the top into several heads, and each sends forth many elegant leaves and a firm stalk.

The leaves are long, large and elegantly divided; each is composed of numerous pinnæ fixed on the two sides of a middle rib which is terminated by an odd one. These pinnæ are not single little leaves, as in many cases, but they are themselves divided by deep incisions, in the pinnated manner, and stand remote, so that the whole leaf is extremely elegant. The middle rib is soft of a purplish colour towards the ground, and lightly covered with a grey scattered down. The whole leaf is six or eight inches long, and has a strong smell not unlike that of camphire, and with some flavour of the tanzyleaf, which it resembles also in division and a general form.

The stalk is round, upright, not jointed; straited and covered with a light greyish down. It is red towards the ground but in the upper part of a whitish green.

The leaves on this are numerous and very elegant; they stand alternately, with young ones in their bosoms; and they are long, narrow and pinnated. The pinnæ are very distinct, though close placed; and though they are not divided again down to the rib, as in the radical leaves, they are yet deeply and elegantly indented.

The flowers terminate the stalk in a large irregular umbell, and their colour is sometimes white; but properly, and always when the plant is well managed, a delicate pale crimson.

As the general umbell is composed of many small flowers, each flower is in the same manner composed of many floscules arranged in a common cup. This is of an oval but somewhat oblong form, and is composed of numerous oval scales, pointed and placed on one another as tiles.

The floscules in each flower are of two kinds, tubular and ligulated: the tubular form the disk, and have complete male and female organs of impregnation; the ligulated are a kind of rays in the verge, which have only female.

The tubular floscules have a rim cut into five expanded segments. The ligulated floscules of the verge are broad, expanded, and cut into three parts at the top, the middle one of which is smaller than the others. In the tubular floscules are placed the filaments; they are five, and they have oblong buttons which coalesce and form a cylinder, with a single slender style of the length of the filaments, rising from a small rudiment, and crowned with an obtuse head.

In the female floscules there are no filaments, but there is underneath them a rudiment of a seed, from which rises a single style with two obtuse heads, which turn back.

The seeds ripen equally after the tubular and ligulated floscules; and they are placed on an oblong and somewhat conic receptacle; and separated by a kind of filmy scales.

The class of the plant is seen in the coalescence of the buttons into this cylindric form; it is the mark of the syngenesious tribe. And as the seeds under the tubular floscules ripen as well as those with the female, the subdivision to which it belongs is that of the polygamia superflua.

The plant is a native of many parts of Europe, nor is limited to those in warmer latitudes, but it flourishes best in them; and naturally affects a loose, deep, and not too rich soil.

To raise it in perfection in the garden, we must copy this.

The seeds ripen freely with us, and should be saved with care, hardened on a shelf, and kept in bags till spring.

Let them be sown on a piece of common ground in the nursery; and when they rise, thinned, weeded, and watered.

In May, five or six of the finest plants should be taken up, and brought into the garden. They will not flower the same year, but their leaves are very handsome, and they will succeed better when they have only this one remove than if they had more. To improve them to the utmost, the mould should be dug out where they are to stand in the garden, and some fresh pasture earth put in its place.

They will flower the succeeding summer, and remain good three or four years, but at the end of that time it is best to have a fresh succession; the seed of which should be saved from the second year's flowering, for they never are so perfect from any other. In all states the plant is of distinguished elegance. *Hill's Gardening.*

ACINI, the small protuberances of mulberries, shawberries, &c. and by some applied to grapes and currants.

ACONITE, *Monkshood*, or *Wolfsbane*, a genus of plants, placed by Linnæus among the polyandria trigynia, in his system of Botany.

There are several species of this plant, but the yellow Pyrenean Aconite is a very singular and elegant plant, though less common than it ought to be in our gardens. It is hardy, of easy culture, and will always prove a source of variety.

It is a native of so many parts of the world, that one wonders to see so few of the botanical writers describe it. This cannot have arisen from their not having seen the plant, but to their overlooking its distinctive characters; they have doubtless confounded it with the common yellow Aconite, supposing that extreme diversity of the leaves accidental, which latter and more accurate searches have found to be specific.

Ray,

Ray, in his catalogue of the European plants, extraneous to Britain, names it, and very justly marks the distinction. He calls it *Aconitum pyrenicum luteum foliorum segmentis sibi invicem incumbentibus*. Linnæus, *Aconitum foliis multipartitis laciniis linearibus incumbentibus squarrosis*: Aconite with divided leaves, and linear segments, loose and lying over one another.

The root is composed of a multitude of long twisted blackish fibres, connected to a small thick head.

The stalk is a yard high, pale, upright and not branched: several shoots rise from the bosom of the upper leaves, but they are small and erect; the main stalk runs up single and undivided.

The leaves are of a pale, but not unpleasing green; and in rich soils often considerably deeper. They have long footstalks also of a faint green, and they hang from them in a palmated form, but with wild and strange irregularity.

Each leaf is divided to the rib into five segments; these are long, narrow, rarely of equal breadth, and cut into deep segments, or at the least, deeply notched at the edges, and sharp pointed.

The lower leaves sometimes have these segments expanded flat and regularly; but the general disposition is much otherwise. The form of the leaf is the same, but nothing is so wild as the arrangement of their segments; they fall against, and over one another; and they expand and twist themselves in various odd directions.

The flowers are extremely elegant; they are numerous, and they terminate the main stalk, and all the branches in a kind of short spikes. Each has its footstalk, their colour is a very singular pale, and as it were whitish yellow. Their form is properly that of the Aconite flower. Extravagant, but too common to have the due admiration.

There is no cup, the body of the flower is composed of five petals, one of which is placed above, two below, and two sideways; the upper petal is tubulate and galeated, inverted or placed with the back upwards, and is obtuse, the head bent back to the base and pointed: to this head, the base where the connection is, stands opposite; this is the strange form of the upper petal, not easily intelligible by words alone, but familiar by comparison of the flower; the two side petals are broad, rounded, placed opposite and convergent; the two lowest are oblong and narrower, and they hang downward.

There are two nectaria very singularly disposed, hid as it were under the upper petal. They are hollow, and have an oblique mouth, and they stand nodding, and have a crooked tail; these singular parts are placed on long foot stalks, slenderer towards the top.

The filaments are numerous, and slender, turning towards the upper petal: they are broad at the base, and have small upright buttons. In the midst of these stand five styles of the length of the filaments, rising from so many rudiments of seed vessels, and terminated by simple reflex heads.

The fruit is composed of many seed vessels, and each contains several rough angular seeds.

It is a native of the northern parts of Europe, and many other cool parts of the world; the soil which best suits it is moist rich mould, and it succeeds best in an open exposure; the shade of trees does not destroy the plant; but it never flowers so well under it, nor is so healthy.

The common and easy way of propagating it is by parting the root in autumn; but it is very easy to raise it from seed, and in that state it always succeeds better. Let some good seed be procured from a plant in an open rich soil, which has not been suffered to produce too large a quantity. No side shoots should in these seed plants be suffered to flower; and the top of the spike should be nipped off to prevent the upper flower. Thus the seed vessels of six or eight of the lower ones will fill with perfect seeds.

Let these be dried in the usual manner, and kept during the winter.

In the beginning of March, let a bed be dug in an exposed part of the nursery, and these seeds scattered on it; and a finger's breadth of mould sifted over them.

When these plants appear, thin them to five inches distant, leaving only the strongest, and in May transplant these into another border in the nursery, at eight inches asunder. In September take them up with good balls of earth, and remove them into the garden. They will flower in full perfection the following season.

Seeds should be saved from the finest plants, with the care above directed, and sown every year. The trouble is little, and the advantage will be, the keeping the plant in its full perfection; and perhaps, improving it every season.

ACORN, the fruit of trees of the oak kind. See the article **OAK**.

ACORUS, *Sweet Rush*, or, the *Sweet Smelling Flag*, *Calamus Aromaticus*, a genus of plants of *Monogynia hexandria* order. It is a perennial plant growing naturally in watry places in many parts of England, and several other parts of Europe. It may be propagated by transplanting the root into moist ground; but it never produces its spikes of flowers except it grows in water.

ADAM'S NEEDLE, a species of a genus of plants, called *Yacca* by botanists, and placed by Linnæus among the *hexandria monogynia*. It is a native of Virginia, and other parts of North America. It seldom rises with a stem above a foot in height, garnished with leaves almost to the ground. The leaves are broad, stiff, and of a dark green colour, terminating in a sharp black spine. They greatly resemble those of the *Aloe*, but are considerably narrower. These plants frequently produce spikes of flowers, which rise from the axæ of the leaves. They are bell shaped, hang downwards, and white within, but each petal is marked with a purple stripe on the outside. They grow on stalks three feet high, branched out to a considerable distance; but the flowers are placed very sparsely on the branches.

These are shrubby plants, in the gardens of the curious; and when grown strong and hardy, will endure the cold of our climate in the open air, and often produce flowers. The plants may be propagated either from seeds sent from abroad, or from off-sets or heads taken from the old plants in the manner of the *Aloe*: (see the article **ALOE**) When they are to be raised from seeds, these are to be sown in a pot of light fresh earth, which being plunged into a moderate hot bed, the young plants will appear in five or six weeks; and when they are two or three inches high, they are to be removed each into a separate pot, which is to be plunged again into the same hot bed, where they are to be watered and shaded, and to have air given them, as the season and the heat of the bed will permit. In July they must be hardened by degrees to the open air, into which they must be removed soon after, to harden them against winter. They must be placed in a sheltered situation, and remain abroad till October, when they are to be removed into the green-house, and placed among the hardier sorts of *Aloes*. They are here to be treated exactly as those plants; and when they are grown sufficiently strong, they may be removed into common borders, where they will remain through our winters, and flower very beautifully. When they are to be raised from the off-sets, these must be laid in a dry place for a week or ten days before they are planted, that the wound where they were taken off from the old plant may heal, else, like the other succulent plants, they are apt to rot in the earth and miscarry.

ADONIS FLOWER. See **PHEASANT'S EYE**.

AFRICAN MARIGOLD, a species of a genus of plants, called *Tagetes*, and too well known in the English gardens to need description here. There are several varieties of this plant, and all of them very subject to vary; so that unless the greatest care be taken in saving the seeds, they are very apt to degenerate.

All the varieties are annual plants, and must therefore be raised from seeds sown every spring, on a moderately hot bed, about the beginning of April. As soon as the plants

plants are come up, they should have plenty of fresh air; for if they are drawn too much, they will not afterwards make a handsome appearance. When they are about three inches high, they should be transplanted on a very moderate hot bed, arched over with hoops, and covered with mats; and as the plants acquire strength, innured to the open air by degrees.

About the end of May they may be taken up, with a ball of earth about their roots, and planted out in the beds, borders, and other parts of the pleasure-garden, where they will make an agreeable appearance in two months time.

Let them be planted out in a showery, or moist time, and in an evening, after four or five o'clock, is the best time of the day to plant them. Be sure not to remove them in dry hot weather, for if that was done, not one plant in ten would succeed.

Take particular care in planting them, to mix the different sorts in a proper manner, so that there may be a variety of flowers in every part; and as soon as they are planted, let them all be moderately watered.

If the weather proves dry, the waterings must be repeated, at least, once every other evening, till the plants have taken root.

But where time will permit, it is the best method to prick these plants now first out from the seed-bed, into a nursery-bed of rich earth, in the common ground, there to remain for a month to get strength, before they are planted out for good, in the borders.

The beds for the purpose, should be about forty inches broad: rake the surface smooth, and put in your plants about four or six inches distant each way, and water them.

Then it would be of great advantage to place a few hoops across the beds, and let mats be drawn over them occasionally, to shade the plants from the sun, till they are rooted; and the mats may also be used in cold nights, to shelter the plants.

There is a great advantage in pricking these plants out in this manner, from the seed-bed, because they can be very conveniently watered and shaded from the scorching sun, till they have taken good root and strength, and can be also occasionally sheltered in cold nights, till they are strong and hardened by degrees to bear the open air fully, night and day.

They will have acquired that hardiness and strength in about four weeks after they are pricked out; the plants must then be taken up with small balls of earth, which will readily hang about their roots, and planted carefully with the balls entire, into the places where they are to remain. *Wheeler's Botanist's Dict.* *Miller's Gard. Dict.* *Mawe's Gardener's Kalendar.*

AFRICAN TULIP, *Hemantus*, a genus of plants classed by Linnæus among the hexandria monogynia.

The roots are composed of many thick, fleshy tubes, which join at the top, where they form a head, out of which rises a fleshy, spotted stalk, like that of the Dragon, which spreads out at the top into several spear-shaped leaves, waved on their edges. The stalks grow about a foot high, and from the side of it near the ground breaks out a strong fleshy foot-stalk, about six or eight inches long, sustaining at the top a large cluster of flowers, included in one empalement or covering. The flowers are of a yellowish red colour, and succeeded by berries of a beautiful red when ripe.

It is a perennial plant, and a native of Africa, has a large bulbous root, from which come out in the autumn, two broad flat leaves of a fleshy consistence, shaped like a tongue, which turn backward on each side, and spread flat on the ground, so have a singular appearance all the winter. In the spring these leaves decay, so that from May to the beginning of August, the plant has no leaves, and always produces its flowers in autumn, just before the new leaves come out. This sort is propagated by planting the roots in pots, filled with light loamy earth, which in the winter must be placed in a moderate degree of warmth; where, during that season, the leaves will be in full vigour, and will make a pretty appearance, when intermixed with other plants in the stove. When the leaves are decayed, the roots may be taken up, and kept

out of the ground till August; then they should be new potted, and may remain abroad till the end of that month, at which time they must be removed into the stove, where they should have frequent, but gentle waterings. *Wheeler's Dict.*

AGRIMONY, *Agrimonia*, a genus of plants, placed by Linnæus among the digynia dodecandria; and of which there are five species; 1. Common Agrimony. 2. White Agrimony. 3. Sweet-scented Agrimony. 4. Eastern Agrimony. 5. Three leaved Agrimony with smooth fruit.

All these sorts are hardy perennial plants, and will thrive in almost any soil or situation, provided they are kept clean from weeds. They may be propagated by parting their roots, which should be done in autumn, when their leaves begin to decay, that the plants may be well established before the spring. They should be planted at least two feet asunder, otherwise their roots will not have sufficient room to spread. If they are propagated by seeds, they should be sown in autumn, otherwise they will not come up the same season.

Hemp AGRIMONY, *Eupatorium*, a genus of plants, placed by Linnæus among the polygamia æqualis syngenesia; and of which there are fourteen species.

1. Hemp Agrimony with spear-shaped, narrow, entire leaves, with three nerves. 2. Hemp Agrimony with a twining stalk and heart-shaped leaves, sharply indented. 3. Hemp Agrimony with a twining stalk and oval leaves. 4. Hemp Agrimony with oval, spear-shaped, indented leaves, upon foot stalks: 5. Hemp Agrimony with distinct, spear-shaped, sessile leaves embracing the stalks. 6. Hemp Agrimony with oval sawed leaves, upon foot-stalks. 7. Hemp Agrimony with sessile, distinct, roundish, heart-shaped leaves. 8. Hemp Agrimony with spear-shaped, veined leaves, the lower exterior ones of which are serrated, and a shrubby stalk. 9. Hemp Agrimony with trifoliate leaves. 10. Hemp Agrimony with finger shaped leaves. 11. Hemp Agrimony with leaves placed in whorls, the leaves spear-shaped, sawed, rough, and standing upon foot-stalks. 12. Hemp Agrimony with heart-shaped, oval, obtuse, serrated leaves, upon foot stalks, and many flowers to the cups. 13. Hemp Agrimony with wooly leaves, joined at their base. 14. Hemp Agrimony with oval, obtuse, serrated, three-veined leaves, upon foot-stalks, and single cups to the flowers.

These species are all perennial plants, the first, second, fifth, seventh, ninth, twelfth, thirteenth, and fourteenth sorts are natives of Virginia; the eighth sort grows naturally in Pennsylvania, and the eleventh is a native of other parts in North America. These may all be propagated, by sowing the seeds in the full ground; but care must be taken in the sowing, to keep the sorts separate, for as the seeds of the plants have a light down adhering to them, they are easily displaced by the least wind; they should, therefore, be sown in drills, but these should be shallow, for if the seeds are buried too deep they will not grow. The bed in which they are sown should not be too much exposed to the sun, but rather have an east aspect, where the morning sun only reaches it; and where it is more exposed, it should be shaded with mats in the heat of the day, and the ground should be kept pretty moist. When the young plants are come up, they must be kept clean from weeds, and thinned where they grow too close; and in autumn following, let them be transplanted to the places where they are designed to remain. As the roots of these plants spread out to a considerable distance, they should be allowed no less than three feet space from any other plants; and some of the largest should be allowed four feet. In dry summers they should be watered, and they succeed best in a soft, gentle loam. These plants may also be propagated by their roots, and some of them have creeping roots, that send out off-sets, by which the plants may be increased. The best time for removing these plants is autumn, as soon as they have done growing; and if the frost should come before they are rooted, it will be proper to cover the surface of the ground with tan, or dried leaves, to keep out the frost. The third species grows naturally in Vera Cruz; the fourth in the island

island of Ceylon; and the sixth in China. These plants, being natives of warm climates, must be planted in pots and plunged into the tan bed in the stove, where, if they are properly supplied with water, in hot weather, they will thrive and flower. The tenth sort, or common Hemp Agrimony, grows naturally by the sides of rivers, and ditches in this, and most other countries in Europe, and the only species of this plant which is known to grow in Europe; but it is seldom cultivated in gardens, where, if once admitted, it would prove a troublesome weed.

Bastard Hemp AGRIMONY, Ageratum, a genus of plants, placed by Linnæus among the *polygamia equalis syngenesia*.

There are three species of this plant, 1. Bastard Hemp Agrimony with oval leaves, and a hairy stalk. 2. Bastard Hemp Agrimony with oval, crenated, obtuse leaves, and a smooth stalk. 3. Bastard Hemp Agrimony with rough, oval, heart-shaped leaves, flower branches growing alternate, and a smooth stalk.

The first and second species are annual plants, and natives of South America. They are propagated by seeds which should be sown in a hot-bed in the spring; and when the plants are come up, and have acquired a sufficient degree of strength, they should be transplanted into another moderate hot-bed, observing to water and shade them from the sun, till they have taken root. In warm weather they should have plenty of fresh air, and about the middle of June be transplanted into the full ground where they are to flower. The third species has a perennial root, and is a native of Canada and Virginia. This species must also be propagated by seeds; but as the autumn in England is scarce ever so favourable as to ripen them, the plant is generally increased by parting the roots in autumn, soon after the leaves begin to decay. They should not be planted nearer to each other than three feet, and should have a rich moist soil, and open exposure. *Wheeler's Botan. Dict.*

AGUE-TREE, see the article SASSAFRAS.

AIR, the thin elastic fluid surrounding the globe of the earth to a considerable height.

Air is one of the most considerable and universal agents in nature, which she is constantly applying in all her works. It appears from experiments made by Dr. Hales, that different bodies contained different quantities of air, from a sixteenth to one half of their whole substance. It is the principal cause of the vegetation of plants, as well as the preservation of animal life; and a certain portion of it is necessary to preserve the growing quality of seeds. It appears by Dr. Hales's experiments that air is inspired by vegetables, not only in their roots, but also through several parts of their trunk and branches; and that this air may be seen ascending in great plenty through the sap of the vine, in tubes affixed to them at the bleeding season. Entering into the vessels of plants, it assists in the rarefaction of the crudities of the earth, in expelling all superfluous moisture, and carrying along with it the salts either contained in itself, or lodged in the earth; it also affects the branches, leaves, and flowers of the vegetables, entering and perspiring through them; and, by refreshing breezes, it moderates the intensity of the sun beams, by cooling, blowing, opening, and extending all the offspring of nature.

Air produces a vibratory motion in several bodies, and particularly in plants, the air-vessels of which perform the office of lungs; for the air contained in them sometimes contracting, and sometimes expanding, according as the heat is increased or diminished, presses the vessels and eases them again by turns, and thus produces a circulation of their juices, which could scarce be otherwise effected.

The air is also very instrumental in the production and growth of vegetables, both by invigorating their several juices, while in an elastic active state, and also by greatly contributing, in a fixed state, to the union and firm connection of the several constituent parts of those bodies, that is, their water, fire, salt, and earth.

On the other hand, air, which is so many ways necessary and subservient to the life and health of vege-

tables, is also sometimes, and, on some occasions, injurious and pernicious to them, not only to the ligneous, herbaceous, and flowery parts above, but also to the roots and fibres below; and it is easy to perceive that a dry, husky, scorching air, may be very prejudicial to the tender fibres of new planted trees.

ALA, is a term used by botanists for the hollow of a stalk, which either the leaf, or the pedicle of the leaf, makes with it: or it is that hollow turning, or sinus, placed between the stalk or branch of a plant, and the leaf, whence a new offspring usually issues. Sometimes it is used for those parts of leaves, otherwise called lobes, or wings.

ALÆ, (the plural number) is used to signify those petals, or leaves of papilionaceous flowers, placed between those others which are called the vexillum and carina, and which make the top and bottom of the flowers.

Instances of flowers of this structure are seen in those of peas and beans, in which the top leaf, or petal, is the vexillum, the bottom the carina, and the side ones the alæ.

ALÆ, is also used for those extremely slender and membranaceous parts of some seeds, which appear as wings placed on them.

ALÆ, is likewise used for those membranaceous expansions, running along the stems of some plants, which are therefore called alated stalks.

ALDER-TREE, *Alnus*, a genus of trees, of which there are two species, 1. The common, or round-leaved Alder, 2. The long-leaved Alder.

Linnæus has classed these two species of Alder with the betula, and placed them among the tetrandria monœcia.

The first sort is the common Alder, propagated in England; the second is very common in Austria, and in Hungary, whence the seeds have been sent to England. The leaves of this sort are longer, narrower, and not so glutinous as those of the first, nor are they so rough; they are also of a thinner consistence.

These two sorts delight in a moist soil, where few other trees will thrive, and are a great improvement to such lands; they are propagated either by layers, or planting of truncheons about three feet in length. The best time for this is in February, or the beginning of March; these should be sharpened at one end, and the ground loosened with an instrument before they are thrust into it, lest by the stiffness of the soil the bark should be torn off, which may occasion their miscarriage; these truncheons should be thrust into the earth at least two feet, to prevent their being blown out of the ground by violent winds, after they have made strong shoots. The plantations should be cleared from all such weeds as grow tall, otherwise they will overbear the young shoots: but when they have made good heads, they will keep down the weeds, and require no farther care.

If you raise them by laying down the branches, it must be performed in October: and by the October following they will have taken root sufficient to be transplanted out, which must be done by digging a hole, and loosening the earth in the place where each plant is to stand, planting the young tree at least a foot and an half deep, cutting off the top to about nine inches above the surface, which will occasion them to shoot out many branches.

The distance the trees should be placed, (if designed for a coppice,) is six feet square: and if the small lateral shoots are taken off in the spring, it will very much strengthen your upright poles, provided you leave a few small shoots at distances, upon the body thereof, to detain the sap for the increase of its bulk.

These trees may also be planted on the sides of brooks, as is usual for willows, where they will thrive exceedingly, and may be cut for poles every fifth or sixth year. This wood is in great request with the turners, and will endure a long time under ground, or to be laid in water. *Miller's Gard. Dict.*

Berry-bearing ALDER, *Frangula*, a genus of plants, of which there are three species; 1. Black-berry

berry bearing Alder, 2. Berry-bearing Alder, with a larger and rougher leaf, 3. Low, rocky, berry-bearing Alder, with a round leaf.

Linnæus considers these plants as species of the *rhamnus*, or buckthorn, and places them among the *monogynia petandria*: but other botanists consider the *frangula* as a distinct genus.

The first sort is common in the woods in many parts of England, but seldom planted in gardens.

The second sort is a native of the Alps, and other mountainous parts of Europe, and found in some gardens for the sake of variety.

The third is a low shrub, not above two feet in height, and grows on the Pyrenean mountains, but hardly ever transplanted into gardens.

All the species are easily propagated by seeds, which should be sown in the autumn, or as soon as they are ripe, and by that means the plants will appear in the following spring, otherwise they will lay in the ground till the next year. The young plants must be kept very clean from weeds while they continue in the seed-bed, and in the autumn transplanted into a nursery, in rows two feet asunder, and the plants a foot from each other. After remaining two years in the nursery they may be planted out where they are intended to remain.

ALISANDERS, or ALEXANDERS, *Smyrniun*, a genus of plants, ranged by Linnæus among the *digynia pentandria*: and of which there are four species.

1. Alisanders with simple leaves embracing the stalks, 2. Alisanders with trifoliate leaves on the stalks, serrated, and furnished with trifoliate foot-stalks, 3. Alisanders with winged leaves, the hinder ones trifoliate, and all the florets fertile, 4. Alisanders with double trifoliate entire leaves on the stalks.

These are all biennial plants; the first is a native of Italy and Crete, the second of England, and the third and fourth of North America; they may be propagated, by sowing their seeds as soon as they are ripe, upon an open spot of ground. The second sort stands recommended as a medicinal plant, and is sometimes cultivated for the table. In the spring the plants should be trod out, so as to leave them ten inches, or a foot, apart each way. During the following summer they must be kept clean from weeds, and in the succeeding February blanched for use.

ALKENET. See the article BUGLOSS.

ALLELUJAH. See WOOD-SORREL.

ALMOND-TREE, *Amygdalus*, a genus of trees, ranged by Linnæus among the *monogynia icofandria*, and of which there are three species, 1. *Amygdalus*, with all the serratures of the leaves acute, or the Peach-tree. See the article PEACH-TREE. 2. *Amygdalus*, with pitted leaves, and the lower leaves glandulous, being the common manured Almond-tree, 3. *Amygdalus*, with pitted leaves, attenuated at the base, or the Dwarf Almond-tree.

The common Almond is cultivated in all the nurseries, and the trees are generally planted for the beauty of its flowers. These often appear in February, when the spring is forward, but if frost comes after, the flowers are soon destroyed, so that their beauty is of short duration, and in those seasons there are few Almonds produced: whereas, when the trees do not flower till late in March, they seldom fail to bear plenty of fruit, many of which will be very sweet, and fit for the table when green, but they will not keep long.

They are propagated by inoculating a bud of these trees into a plum, almond, or peach-stock, in the month of July. The next spring, when the buds shoot, you may train them up either for standards, or suffer them to grow for half-standards, according to your own fancy. The best season for transplanting these trees, if for dry ground, is in October, as soon as the leaves begin to decay: but for a wet soil February is much preferable; observe always to bud upon plum-stocks for wet ground, and almonds, or peaches, for dry.

African ALMOND-TREE, *Brabejum*, a genus of plants, containing only one species, viz. African, or Ethiopian Almond, with a silky fruit; it is a native of

the country, about the Cape of Good-Hope, where it rises to a considerable height: it is too tender to live through the winter with us in the open air, so that it must have a good green-house in the winter: but in the summer it should be placed in the garden in a sheltered situation.

This plant is not propagated by layers without difficulty, as they are often two years before they make shoots strong enough to be taken from the mother plant. The best time to perform this operation is in April, just when the plant begins to shoot, and the layers must always be of the former year's roots.

This plant will make a very pretty appearance among other exotic plants in the green-house; it rises with an upright stem, which is soft, and full of pith within, and covered with a brown bark; the leaves come out all round the branches at each joint, indented at the edges, and stand on very short foot-stalks; the flowers are produced near the end of their shoots, and are of a pale colour, inclining to white.

ALOE, a genus of plants, ranged by Linnæus among the *monogynia hexandria*: and of which there are fourteen species; 1. Aloe, with nodding flowers, growing upon foot-stalks, in form of a cylindrical corymbus, or the common Aloe; 2. Aloe, with nodding, branching, prismatic flowers, growing upon foot-stalks, and spreading equally at the brim, commonly called Partridge-breast Aloe; 3. Aloe, with flowers growing upon foot-stalks, and the foot-stalks oval, cylindric, and crooked; 4. Aloe, with sessile, horizontal, funnel-shaped, equal flowers, turned back at the brim; 5. Aloe, with sessile, oval, crenated flowers, and the interior segments connivent; 6. Aloe, with sessile, triquetrous, two-lipped flowers, and the upper lip turned back, commonly called Cushion Aloe; 7. Aloe, with sessile, funnel-shaped, two lipped flowers, cut into five revolute segments, erect at the top; 8. Aloe, with sessile, two lipped flowers, the upper lip erect, and the under one spreading, commonly called Large Pearl-Aloe; 9. Aloe, with sessile, reflexed, imbricated, prismatic flowers; 10. The common Barbadoes Aloe; 11. The Socotrine aloe; 12. The Cobweb Aloe; 13. The Guinea Aloe; 14. The Ceylon Aloe.

Of these species there are a vast variety, particularly of the first sort: they are all perennial plants, and natives of Africa, and the Indies. Some Aloes are arborescent, inclining to make large trees, breaking forth into branches; others are so small, that a whole plant does not exceed the size of a crown-piece: some grow close to the ground, others are more aspiring, and have their crown of leaves raised upon a stem, somewhat above the earth; they are cultivated as great curiosities in our gardens, and reputed one of their chief ornaments. In reality, there is scarce any tribe of plants which affords a more pleasing variety than these, from the odd shape of their leaves, the various manner of their shooting, and being some of them covered, as it were, with pearl.

As the variety of these plants is very great, so their culture differs extremely. Most authors recommend one general method of cultivation, but this is founded on erroneous principles, and therefore will not always succeed. We shall, therefore, endeavour to obviate this defect, by explaining the different methods that ought to be pursued in the cultivation of these beautiful plants.

Purple Socotrine ALOE.

This is a plant of considerable beauty, and by a judicious management will flower with us abundantly, and with its full native vigour; Linnæus calls it Aloe with drooping subcylindric flowers, placed on foot-stalks: but it is generally known by the name of purple Socotrine Aloe.

The root is thick and of an irregular shape, covered with a brown bark, and hung with many fibres.

The leaves rise from it in a beautiful round cluster: the central ones more upright, the others more and more obliquely.

They are very beautiful in form and colour: their length is a foot and half; they are of a lively green, and they are narrow, thick, and fleshy: they are terminated by

by a thorny point, and they have all along each edge a row of pale and pointed, but not very firm spines.

The stalk rises in the center of these, and is round, thick, smooth, of a purplish brown, and two feet in height, decorated towards the top with a few leaves.

The flowers attract the eye, and they demand its full attention.

They are extremely numerous, clustered into a thick, long spike, and of a most elegant purple: not a deep, dusky tint, but pale and lively.

The leaves of this plant being cut, drop out a yellow, bitter juice, not stinking, as the common Aloe, but sweet, and somewhat aromatic.

The flowers stand naked on foot-stalks, without any cup, and are succeeded by an oblong seed-vessel, formed of three valves, and containing, in so many cells, numerous angulated seeds.

Within each flower stand six slender filaments: these are of equal length with the body of the flower: and upon them are placed little oblong buttons, which shew themselves beyond its verge.

The style is single, and of the same length with the filaments.

Culture of the Purple Socotrine ALOE.

The elegance of this plant, and its full beauty in flowering, depend entirely upon a proper method of management; and its flowers are so great an ornament to whatever place they decorate, that it is very well worth all the pains necessary in the cultivation.

The first principle on which the success in the flowering of it depends, is this: that though it will live in a less degree of heat, yet it always flowers more successfully in a greater; this has been proved in the Dutch gardens, and must be a lesson to all who raise it in ours.

The propagation of it is easy. In its native state it throws off abundance of healthy suckers, and with tolerable care, will do the same here; these seldom fail to grow up into handsome plants.

The best are those obtained from Africa, its native soil, and they are very easily brought over; but it will rise to a great deal of beauty, from those taken from plants in our own pots.

A great article, is the soil in which they are planted, and there is nothing in which the common practice errs so widely.

In Africa this Aloe covers the side of sandy hills, and is sometimes found near the sea.

Those who have examined the soil in these places, have found it full of sand, and of a loose, white earth, like mortar; but after proper enquiries, it has been found that this substance, which has been compared to lime rubbish, is nothing more than marle.

We have this in England in great abundance, and the farmers use it, though the gardeners are not enough acquainted with its property.

This is lodged in a brittle sandy earth in these native beds of Aloes; and this is the soil we should imitate, and may fully equal.

The first step, therefore, in the culture of this and other African Aloes, delighting in the same kind of soil, is to form a mixture of five bushels of light sandy earth, from a barren upland pasture; one bushel and a half of marle, and one bushel of river mud; let this be piled in a heap together, and turned once a fortnight; and when it has lain a month, let there be sprinkled over this quantity two ounces of sea-salt. This compost will mellow into a light and crumbly soil, though, till touched, it holds firmly enough together. It will therefore cling sufficiently about the root of the plants, and yet not load them or oppress their tenderest fibres.

This being prepared in spring, will be fit for use about the beginning of August, which is the most successful time for propagating these plants.

At this season, fill as many small pots with this compost as you can obtain suckers; first, laying a piece of tile at the bottom of the pot, to keep open the hole, for if that be stopped, the water given for the support of the plant, being detained, will be its certain destruction.

The pots being ready, take off the suckers carefully

from the mother plants. Lay them in the open air, but out of the reach of the sun and wind, that they may harden a little, for otherwise they will rot at the base, and come to no perfection, whatever care be taken of them.

When they have lain three days in the air, plant one in each pot, taking care that the earth falls every way close about the bottoms; when they are all planted, set them under the shelter of a hedge, and shade them with mats, but not so close as to deny them air.

In this place let them stand ten days, and then remove them into a bark-bed, which has but a very gentle heat. Set the pots in this up to their rim, and shade the beds with mats, but raise the glasses to admit air.

When they have in this bed rooted pretty well, they must, by degrees, be inured to more and more air, and when they bear this without hurt, it will be time to take them from the bed.

About two months from their first planting, they may be taken out of the bed; but as the season will be now advanced, and cold nights come on, they must not be set out into the open air, but taken from the bark-bed to the green-house.

They must be there placed forwards, and have a great deal of air by day, but they must be defended by shutting the glasses in an evening.

All this time they must have frequent gentle waterings, and let the gardener take care that the passage at the bottom of the pot be free, and no wet lodged in it.

In October they must be removed into the stove, and from this time they must have frequent waterings, the water having stood four and twenty hours in the stove, that it may be of the same temperature with the air.

With this management they will grow very considerably during the winter, and when the spring comes on, they must be admitted to a more free air by very slow degrees, because the winter's growth has made them tender.

Towards the middle of the summer they must be again removed into the green-house out of the stove, and gently watered at times.

In the very heat of summer it will do them good to set them out for a few weeks among the green-house plants, exposed at that season, but they must not be exposed to the least danger of cold nights.

This care is to be repeated and continued according to the seasons, and thus the off-sets will be brought to flower about the third year.

The beginning of August will be afterwards the best time of removing them from their old earth, and giving them new of the same kind; this greatly strengthens their growth, and promotes their flowering.

To this purpose they must carefully be taken out of the pot, and all the earth wiped from about the roots.

Let the several parts be then examined, to see whether any be decayed, and if there be let such be cut off. Then put some pebbles into the bottoms of the pots; fill to a proper height with the compost, and carefully put in the plant.

Distribute its roots regularly, pour in a little of the soil very dry between them, and shake the pot that it may settle among the roots; Then cover them with more, and fix them securely and steadily in the pot; put them again into the green-house, and give them a gentle watering.

This must be occasionally repeated, and under this advantage of shade and shelter, moisture and warmth, they will presently accommodate themselves to their new earth, and grow with vigour.

This is the whole care required in nursing up these Aloes to a due degree of strength for flowering; but when the time for that approaches, a particular attention must be shewn to them.

They will flower as they stand in the green-house, but the flowers will not there have half their natural beauty. More heat is given by nature for this purpose in their own country, and more must be allowed them here.

Towards the time of their natural flowering, the second

cond or third year, let the gardener watch his plants, and when he sees any one shoot for a stalk, remove it into the stove. There let him give it water often, and in little quantities, and always warmed, by standing in the stove, to its proper temperature. Thus the flowering stalk will rise with its natural advantages, and will produce a spike of more than fifty flowers, opening in a gradual succession.

After this the plants will continue regularly flowering every year, and producing a sufficient number of off-sets from the sides, by which a new succession may be raised, as we have directed.

The care and management of the grown up plants must be the same with that of the young ones, which we have already given; and no more is required to preserve them in their full vigour.

Short thick leaved ALOE.

The Aloe we last recommended to the attention of the reader, was distinguished by its noble aspect and numerous flowers. We shall now describe another which claims an equal regard, but from another source; its elegant simplicity, and called by gardeners the thick short leaved Aloe. Linnæus calls it Aloe with sessile and three square flowers, formed with two lips, the under one turning back.

It is a smaller plant than most of the Aloe kind, but never fails to attract the eye, even of those unaccustomed to such objects, when placed among the most rich and glaring.

The root is composed of numerous brown fibres.

The leaves spring in a cluster from its head, and raise themselves partly upright; they are short, extremely thick, sharp pointed, and turning down with a large thick end, appear there triangular. Their colour is a very fine green, striped in a regular and elegant manner with white, and they are frequently tipped with beautiful red at the point.

This variety of colour added to the singularity in form of the leaves, renders the plant very pleasing when no more appears; but its flowers, when the season and right culture call them forth, answer to them very well in beauty.

The stalk which supports these rises in the center of the leaves, and is eight inches high, round, smooth, and of a purplish colour.

The flowers are neither numerous nor specious; but they appear sometimes prettily veined, and at others elegantly simple.

When the culture has been the least injudicious, if the plant happens to shew its flowers, they are of a faint green.

In better culture they often appear elegantly striped with green and white: and where the plant succeeds best they are perfectly white.

They are small, and they crown the top of the stalk raised to support them in a loose irregular spike.

Sometimes they grow close to the stalk, sometimes each has its separate slender pedicle: these are usually very short, but sometimes a little longer; and they are always of the colour of that part of the stalk from whence they rise.

The flower examined with a curious eye, is found to be tubular towards the base, and expanded at the mouth; it is marked obscurely with three ridges in the tubular part, and divided in an irregular manner at the opening into two lips; the lower one of these always rolls back; and usually all the segments do more or less the same.

The flower has no cup, but adheres naked to the stalk; and within stand six filaments, each crowned with an oblong button, with a single stile in their centre, terminated by a three parted top, or stigma.

When the filaments are traced to their bottoms, they will be found inserted on the receptacle. This is a singularity in a flower formed of one petal, and abundantly distinguishes the Aloe kind from all others.

It is singular in this Aloe that it has not the bitter resinous juice with which the leaves of most others abound. When a leaf is cut what runs from it is watery, colourless, and perfectly insipid.

Culture of the short thick leaved ALOE.

We have already observed that this species often loses half its beauty by an injudicious management: the following method therefore should be carefully observed; let the gardener seek for a firm loamy earth under the turf in some pasture which lies on the descent of a hill. He will usually find it of a yellowish brown colour, and covered with an inch or two of mould.

Let him pare off the turf, and this light covering which has arisen from the rotted leaves of grass, and the dung used as manure.

Let him take a barrow full of the clean loam and mix it with a quarter of a pound of salt and a peck of stiff marle.

Let these be put together early in the spring and they be will ready for use by midsummer.

The marle will have sufficiently opened the body of the loam by this time, and the season will be come for propagating the plant.

This is very easy for the Aloe is so full of life that every leaf will grow.

Let therefore half a dozen of the freshest and finest of the leaves be taken from the lower part of some flourishing plant. Let these be laid on a shelf in any room three days, and they will be then fit to set.

Fill as many middle-sized pots with the compost. Set one leaf in each, with the part where it adhered to the old plant downwards, and cover it up half the height with the mould. Give it a very gentle watering.

Set the pots in a bark bed of a moderate heat, and shade them from the sun.

Every other evening give them a gentle watering, and in the middle of the day admit some air by raising the glasses. Thus they will root; and in this manner they will be raised, like cuttings of other plants, to their perfection. The care and management of them after this must be exactly the same as that of the other African Aloe already directed, only that they must have oftener water; and that the gardener must carefully watch the time of their first shoot for flowering.

When this appears, they must be watered twice a day, a very little at a time; and have more warmth than before.

This management will bring on the flowering stalks, and whether the flowers be perfectly white, or slightly striped with green they will be very beautiful.

It will flower annually and there will never be more greenness in the flower, than one, or at the most two delicate streaks of it on each division.

Yellow cluster-flowered ALOE.

The Aloes are in general handsome plants, and they succeed one another very happily at this season; when flowers in general are scarce.

This is an elegant kind; and deserves the more regard, as it differs from the generality, particularly in the colour of the flowers, as well as in their disposition: the leaves also have their singularity.

Its characters are so strongly impressed, that most who have written of it, have called it by the name of Aloe.

The root is thick yellow, and sends out numerous, large, and very long fibres.

The leaves arise in a great cluster, and they are extremely long and narrow, of a triangular shape, and of a deep green colour; they are involved together at the bases, and with good culture, will rise to five feet in height.

The stalk rises singly in the center, and is round, thick, upright, and five feet high. Upon the top of this are placed the flowers.

This is all greatly to the advantage of the plant; but its scent is disagreeable; it is not however strong or offensive, unless purposely smelt.

The flowers, whose form is truly that of the Aloe kind, should have prevented error in respect of the genus, but they have not done so universally.

Culture of the yellow clustered ALOE.

The native country of this Aloe, is the cape of Good Hope, and it there lives only in damp rich soils. The black

black mould which is the common soil of the swampy places, in that country is its natural ground.

This is very different from the soil in which the Aloes in general delight, and it shews also, that more frequent and large waterings are required for this than for any of the other species.

According to the instructions, here proposed from nature, let this Aloe have a peculiar compost, altogether different from the others, and thus prepared.

Just pare away the turf in a wet rich meadow, and take of the fine black mould that lies under it four bushels, add to this of marle one bushel, of wood-pile earth three pecks, and one peck of cow-dung.

Let this be laid together two months, or more, turning it once in a fortnight, and it will then be ready for service.

In this the plants are to be propagated by means of those suckers, or off-sets, which they yield in abundance where they thrive tolerably. The time for planting these is the middle of July.

They must be taken off with great care from the mother plant, and laid two days on a shelf in a cool airy place to harden. After this one must be planted in each pot in this compost, and that with all possible care.

When they are all planted, let the pots have a very gentle watering, and set them in a warm shady place. Here let them stand another fortnight without any farther care.

Then bring them to a bark bed, which has a very moderate heat, and set the pots two thirds of their height in the bark; draw a mat over the glass and thus let them stand all day.

In the middle of the next day raise the glasses a little by a notched stick.

In this manner let them be kept in the bed three weeks, and then by degrees more and more hardened; till at length the glasses are taken quite off in the middle of a warm day.

After this they must be removed into the green house, and from thence into the stove.

This is the method of bringing them to their greatest perfection.

They must be frequently watered in the stove; the water having stood three or four and twenty hours to bring it to the temper of the place.

Under this management, they will grow a great deal in the winter; and in spring will be in fine forwardness towards flowering. They are singular in the highest degree, even in the leaf, and a great ornament to the place.

White spotted ALOE with tongue-like leaves.

Few of the Aloes deserve more than this the attention of the curious in exoticks.

The form and variegation of the leaves which always retain their beauty, give it a pleasing aspect the whole year, and when in flower it is extremely handsome.

The root is fibrous, the leaves rise from its head in a considerable number, and are broad, flat, thick, and ten inches or more in length. Their colour is a beautiful strong green, and they are spotted in a various and perfect irregular manner on the upper and under side with white.

The tips and edges of these also have their singularity. While they are young, they are white and edged with a transparent rim; this soon loses itself on the edges which grow rough and unequal from its fragments, but on the end of the leaf, it remains longer.

From the bosom of the central leaves come the flowering stalks, usually there rise two of these, but sometimes there is only one; it is round, not very upright, of a greenish colour tinged with red, and two feet and a half high.

This with good culture will be loaded almost from the bottom to top with flowers, and these disposed in a very elegant manner; they rise singly with long red foot stalks of a hooped form, so that they are brought near the main stalk, though not to touch it, and are intermixed with a fine irregularity one among another.

They are of a tubular form, and their colour is a perfect scarlet.

They have no cup but adhere naked to the foot-stalk; one petal forms each of them, and it is swelled toward the base, smaller at the neck, and nipped into six segments at the mouth; six filaments, and a single style are placed in it, as in the other Aloes.

Culture of this ALOE.

It is a native of Africa and there thrives in the clefts of rocks, and in the most barren soils. This refers its culture to two articles; that it be placed in small pots, where the root may have no more than in its natural growth, and that the soil be poor; for the rest, the culture we have given for the other African Aloes will do with it.

The old plants produce off-sets every season; and these are to be planted in the manner we have before directed, and they will flower the second year.

Prickly spotted leaved ALOE.

The Aloes all have beauty, and their variety is also a great recommendation.

The same conveniences and care needful for one kind will raise many more, and their flowering at a season barren of most other things, adds to their estimation; we have for this reason given the culture of many of the Aloes and shall of several more.

None claims that regard we have shewn to the genus more than this, whose leaves as well as flowers are full of singularity and beauty.

The root is formed of many thick reddish fibres. The leaves rise sometimes naked from the ground, and sometimes are supported on a kind of stalk, thick, short, and filmy. They are fleshy, oblong and broad; their colour is a deep green, spotted on both sides irregularly with white: and they are edged with sharp and strong thorns variously disposed, and terminate in a very robust, sharp point.

The stalk rises in the centre of the leaves, and is round, firm, upright, of a purplish colour on the lower part, and paler upwards.

The films towards its top are numerous though slight, and they of a mixed whitish green colour, dashed with purple.

The flowers terminate the stalk in a beautiful manner. They rise nearly together, and they have separate, long whitish foot-stalks; these spread out from the top so as to form a kind of umbell, and they are long, hollow, and of a fine red.

The class to which the Aloe belongs is to be read in these, and we have had occasion to explain it at large before; we shall therefore only observe here that the flower as in other species of the same genus, is formed of a single petal, that it adheres naked to its foot-stalk without a cup; and from a long and tubular body of an irregular form, opens into six segments at the rim, or frequently one more.

Culture of this ALOE.

The culture of this Aloe having been in general laid down before, as well as the character of the class, we shall not, except in regard of such species, as from their nature require particular management, enlarge here by repetition, but name the general articles.

This is one of the African Aloes, which produces suckers in abundance, therefore it is easily propagated: its soil is in its natural climate, loose, dry, and sandy; therefore the general compost we have directed for the Aloe kinds, will perfectly answer its purpose.

The suckers are to be taken from the old plants in the latter end of summer and they should be laid upon a shelf two or three days before they are set: they are then to be carefully planted in the middling pots of the compost, and from that time raised with the same care we have directed for the other kinds.

Warted coral ALOE.

The everlasting variety of the Aloe kinds has had sufficient attention among our collections; and there are few which more deserve it than the present.

The root is thick and pale. The leaves rise from this in a cluster, and split into two arrangements: they are so very singular and beautiful, that if the plant had nothing more to recommend it, none would refuse it a place in their collections.

They are eight inches long, moderately broad, thick, and somewhat triangular in form.

Their colour is a very strong and elegant green; and they are covered on both sides with white tubercles in the manner of warts. These have no regular shape or form, but lie scattered in a thousand figures upon every part of the leaves to the extremity, where they terminate in a point.

The flower-stalk rises to the height of two feet and a half, and is round, of a glossy red, resembling a piece of polished coral. Towards the top it droops with the weight of a long spike of flowers.

These are oblong, hollow and divided at the rim into six irregular segments which turn back a little. Each flower has a short and slender foot-stalk of a paler red than the principal stalk, on which it hangs in a drooping posture.

The general colour of the flower is red, but toward the base it is greenish; and from this part there rise several lines, or very narrow streaks of white. These, as well as the green base, are most distinct in the unripe flowers; for in those fully mature, the red is almost universal.

The rest of the flowers are like the others of the Aloe kind, which we have described before. It is formed of one piece; it hangs to the foot-stalk without a cup, and within there stand six filaments, which are of the length of the tubular part, or a little more, with a single style among them.

The seed-vessel which follows is oblong, and formed of three furrows, and divided into three cells in each of which are numerous small seeds.

Culture of this ALOE.

This is one of the African kinds which produce a great number of off-sets and are easily propagated from them.

The best soil for it is made in the following manner; mix equal parts of dry pasture-earth and sand: add half the quantity of soft chalk. To four bushels of this mixture put a peck of lime. Mix these well, and let it lie out a year.

Then fill as many pots as there are to be suckers raised. Let the suckers be carefully taken from the old plants, and laid on a shelf in an airy room, till the bottom, where they adhered, is dry: they are then fit to be planted.

The pots must be very small, and the whole management the same as in the other African kinds, which we have mentioned already.

If this compost be not made in time, the common kind we have already directed for the African Aloes, will answer the purpose: but it is in this particular mixture we have seen the plant rise to its full perfection.

Pearl ALOE. See plate 1, fig. 1.

The root of the Pearl Aloe is thick, and variously divided. The leaves are very numerous, extremely singular in form, and whether we regard their shape or disposition, full of beauty.

They rise clustered together, and display themselves variously, some nearly upright, some flat upon the ground, and others at different angles.

All are of the same shape and hue: and the points of all turn upwards; they are thick and fleshy: their colour a very lively green, and they are covered in a various and irregular manner with spots, and rising tubercles: these are of a firm substance, and in colour of pearly white, and they are most conspicuous on the younger leaves.

The shape of the leaf in this plant is not less remarkable than the ornament: it is of an oval form in the whole, but the point is immoderately long and slender; toward this point the leaf grows triangular, and the extremity is tipped with crimson. This, with the fine green of the body of the leaf, and its pearly protuberances, give a delicate variety: but the points are most red on the old leaves, and these have the tubercles least distinguishable.

The stalk is two feet high, and towards the top usually divides into three or four branches; it is round, green,

smooth: purplish at the bottom, and without leaves.

The flowers want colour to make them beautiful, but they are numerous and singular enough in form: they cover the tops of all the branches in a kind of spikes; each has its very short and slender footstalk, and is tubular in the body, and expanded in six segments at the rim. There is some tinge of red often at the base of the flower, and the rest is of a whitish green. The division at the rim is so far singular, that it forms two rude lips, of which the upper turns a little back.

There is no cup to this flower, but in its hollow part rise six filaments, and a single style.

It is a native of Africa, and is to be propagated as the other African Aloes, from suckers.

AMARANTH, *Amaranthus*, a genus of plants, ranged by Linnæus among the *pentandria monoecia*: and of which he distinguishes eleven species.

1. *Amaranthus*, with round heads, flowers with the stamina embracing the stalks, and pointed spear-shaped leaves; 2. *Amaranthus*, with three stamina to the flowers, round heads growing close to the stalk, and spear-shaped leaves growing thinly on the stalks; 3. *Amaranthus*, with three stamina to the flowers, round heads growing from the wings of the stalks, round spikes, and oval-heart-shaped leaves, with short footstalks; 4. *Amaranthus*, with three stamina to the flowers, erect spikes, growing close, and oval blunt leaves; 5. *Amaranthus*, with three stamina to the flowers, which grow in clusters from the wings of the stalks, and spear-shaped, obtuse leaves; 6. *Amaranthus*, with flowers collected in heads, on the sides of the stalks, oval, blunt leaves, and scattering stalks; 7. *Amaranthus*, with five stamina to the flowers, cylindrical, pendulous, and very long spikes; 8. *Amaranthus*, with five stamina to the flowers, cylindrical spikes growing horizontally, and a smooth stalk; 9. *Amaranthus*, with five stamina to the flowers, cylindric, erect spikes, and a smooth stalk; 10. *Amaranthus*, with five stamina to the flowers, spikes proceeding from the wings and extremities of the stalks, a flexible stalk, and recurved branches; 11. *Amaranthus*, with five stamina to the flowers, upright cylindrical spikes, and spines at the points of the stalks.

Culture of the AMARANTHUS.

These are all annual plants; the first and second sorts are natives of India, and have been long cultivated in the English gardens, for the beauty of their variegated leaves; especially the first species, the leaves of which are of three colours, green, yellow, and red; these colours are very elegantly mixed: and when the plants are in full vigour, the leaves are large, and closely set from the bottom to the top of the stalks, and the branches form a sort of pyramid, so that there is not a more beautiful plant than this, when it is in full lustre, from the leaves of this plant being party-coloured, like the feathers of parrots.

About the middle of February provide some new horse-dung, and let this be thrown up in a heap, and in eight or ten days it will be in a proper condition for making the bed, which should be about two feet and a half thick of dung. Let the top be levelled, and then set on the frame and glass.

When the burning-heat of the bed is over, lay on the earth, which must be rich, light, and perfectly dry, and broken pretty small, by rubbing it between the hands.

The depth of the earth on the bed must be about five or six inches, and the surface made very level and smooth.

The bed being thus finished, the seed must be sown on the surface, and covered about a quarter of an inch deep with light earth, well sifted: or you may draw shallow drills from the back to the front of the bed, sow the seeds in these drills, and cover them about a quarter of an inch, as above directed.

As soon as the plants appear, let them have fresh air every day, when the weather is any thing mild, and let them have now and then gentle sprinklings of water, observing to cover them every night with glasses.

About the middle or latter end of March let there be another hot-bed,

hot-bed, about thirty inches thick, levelling the top, and setting on the frame. When the great heat is evaporated, let a quantity of light, rich, dry earth, sufficient to cover it about six inches thick, be laid equally on the surface of the dung. When the earth is warm, prick the plants therein at three or four inches distant from one another, and give them a gentle sprinkling of water. Put on the glasses, but remember to raise them a little every day, to let out the steam: and be very careful to shade the plants from the sun, till they have taken root.

As soon as they are rooted and begin to push, they should every day have fresh air, by raising the glasses to a considerable height. They must also have frequent sprinklings of water, though but a little at a time.

In April another hot-bed should be prepared: for if these plants are desired to appear in any tolerable degree of perfection, they must, at this time, be brought forward, by the assistance of a regular and due degree of artificial heat; and where this is properly attended to, the plants will be strong, their leaves elegantly variegated, and their flowers large and beautiful.

The bed intended for this purpose should be made of the best horse-dung, which has been previously well-prepared; it should be two feet thick at least. Level the surface, place the frame thereon, and when the burning heat of the bed is over, cover it equally with light, rich earth, not sifted, but well broken with the spade and the hands, six or seven inches thick. And when the earth has laid on the bed about twenty-four hours, it will be in a proper condition to receive the plants, which must be taken up very carefully with balls of earth about their roots, and planted in the new bed, full six inches distant every way, giving them, at the same time, a light watering, to settle the earth properly about their roots.

This being done, put on the glasses, and let the plants be shaded from the sun, till they have taken root. A single mat thrown over the glasses, when the sun is so powerful as to cause the plants to flag, will answer the purpose.

Remember to raise the glasses a little height every day, that the steam of the bed may pass freely off; and if there should be much steam in the bed, it will be proper to raise the glasses a little at one of the corners at night, hanging a mat before the opening, to prevent the cold air from blowing on the plants.

As soon as the plants have taken root, and begin to shoot, let them have fresh air freely, every day, when the weather is calm and mild: for this will greatly strengthen the plants; but the glasses must be shut down every night, provided there be no great steam in the bed, and a mat or two spread over them. Remember also to refresh the plants, frequently, with moderate waterings, for this will greatly promote their growth.

When the plants have advanced so much in height, as nearly to touch the glasses, let the frame be raised at the bottom about six inches, in order to give them full liberty to shoot: and continue to raise the frame, in proportion as the plants advance in height. But, remember, whenever you raise the frame, to close up the vacancy at the bottom, that no air may enter but at the proper place. This may be done, by nailing mats to the bottom of the frame. If you have a multiplying frame, this labour may be saved, and the plants will thrive the better. These frames are described under the article HOT-BED, which see.

In about the third week in the month of May, those plants, which are intended to be drawn to a large size, should have another hot-bed.

This bed should be made almost wholly within the ground. And in order to this, let a trench of the length and breadth of the frame intended to be placed on the bed, be dug eighteen inches deep. Let this trench be filled with well-prepared horse-dung, shaking it in regularly, and beating it well down with the fork, till the dung be six inches above the surface of the ground, so that the bed from the bottom to the top, will be two feet deep of dung.

The bed being thus made, set on the frame and glasses, which will draw up the heat soon, and the bed will be ready to receive the plants in five or six days after the bed is finished.

The plants must now, in general, be potted before they are set into the bed. The pots for this purpose must be about the middle size, and the plants must be placed in them, when the bed is just in right order to receive them.

Having the pots and some fresh earth ready, let as much of the earth be put into each pot as will cover the bottom about three or four inches: then take up the plants, each with a ball of earth about its roots, and place one plant with its ball intire in the middle of each pot, and fill up the vacancy with the fresh earth, within half an inch of the top of the pot, and let them be moderately watered.

Place the pots immediately upon the hot-bed, as close together as can be; observe that the cavities between the pots are perfectly well filled up with earth: and this should be done according as the pots are placed upon the bed, bringing the earth up to the rims of them.

When the pots are all in, put on the glasses, observing to tilt them up a little at the back of the frame every day, to let in fresh air to the plants.

The plants must be shaded, occasionally, from the sun, for the first week or ten days; let mats be spread over the glasses the first three or four days, about eight or nine o'clock in the morning, and taken off about four in the afternoon; but after this let the plants have more sun, every day, till they are able to bear it fully.

They must be duly supplied with water, during the time they are in this bed: and they should have a moderate quantity given them once in two days.

Observe that when the plants advance in height, to raise the frame, to give them full room to grow.

When there is the conveniency of a drawing frame, (described under the article HOT-BED,) it should now be placed over them: but where there is no such convenience, let one of the common frames be used; according to the following method.

Fix at each corner of the bed an upright post, about four feet high: and on the inside of each post let some augur-holes be bored, hollowing six inches between the holes.

Then provide four iron, or wooden pins, one for each post, and fit for the holes.

When the frame wants raising, let the pins be fixed in the post at a convenient height, and set the frame upon the pins. When the frame wants to be raised again, fix the pins a hole higher, and so proceed as the plants rise in height.

Mind to close up the vacancy at bottom, at each time of advancing the frame; this may be very easily done, by nailing some thick mats round the outside of the frame.

These are the methods for drawing these kinds of plants, where there is not the conveniency of a glass case: and if they are well managed, may be brought to a very handsome size.

AMARYLLIS, [*Lily-daffodil*, a genus of plants; ranged by Linnæus under the *hexandria monogynia*, and of which he has enumerated nine species.

1. Amaryllis, with many flowers from the cup, and those equal, and of a campanulated form, commonly called the crimson Amaryllis, and by some writers the American Lily; 2. Amaryllis, with a roundish, two-edged stalk, and with numerous, equal campanulated flowers, generally called the striped Amaryllis; 3. Single, irregular-flowered Amaryllis, with the filaments and style delineated, usually called the Jacobean Amaryllis; 4. Single-flowered, with the flower upright, and the threads sloping, commonly named the golden Amaryllis; 5. Single-flowered Amaryllis, with a regular flower, and drooping filaments, generally called the golden Amaryllis, by some authors the autumnal Daffodil, and by others the African Lily; 6. Double golden Amaryllis, called by some the double autumnal Daffodil; 7. Many-flowered Amaryllis, with tongue-like leaves, and irregular

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gular flowers, often called crimson, oriental Amaryllis; 8. Many-flowered Amaryllis, with regular flowers, and sharp pointed leaves, commonly called purple Ethiopian Amaryllis; 9. Many-flowered Amaryllis, with the petals turned back, and the filaments and style ranged close together, generally known by the name of the Guernsey Lily.

Crimson AMARYLLIS.

The most vulgar eye is struck with the beauty of this plant, and it very well deserves the title of elegant; its proper name is *Amaryllis*, with many flowers from the cup, and those equal, and of a campanulated form, and with the threads crooked.

The root is large, and of a rounded form; the leaves are long and flaggy, but of a fresh and very lively green. The stalk is round, firm, upright, green, and juicy. The flowers stand at the top, several rising from one point together, out of a common scabbard, and spreading out each way to form an elegant cluster.

Each flower is very large, and extremely elegant; its colour is a fleshy crimson, and in the centre there is a large circle of yellow, terminated every way by a kind of rays; each separate flower grows naked to its footstalk, without a cup: the scabbard at the top of the main stalk serving that office for all.

The body of the flower is composed of six broad, waved, and pointed petals, rising small and slender from the base, and spreading elegantly at the opening. Within stand six long and very conspicuous filaments, with large buttons at the top; the filaments droop and bend, and their buttons rise upward. In the centre of these stands the style, a little shorter than the filaments, bending in the same manner with them, and parted at the top into three slender segments. The seed-vessel is oval, and contains, in three cells, numerous, moderately large seeds.

Culture of the Crimson AMARYLLIS.

It is a native of the warmest parts of Armenia, and its roots are brought thence in abundance; our people complain that they are rarely good: but this is owing to an error in the management.

The roots, when taken up, are planted, through a mistaken care, in boxes of damp mould, by being removed at a wrong time they are weakened, and they rot with the abundant moisture.

Every one knows that roots of all this kind of plants will bear to be kept several months out of the ground, taking them up at proper seasons; and thus they may be transported, without fear of accidents. It is natural in these plants for the flowers to appear before the leaves.

About the first week in September a naked stalk rises to support the flowers; soon after come the leaves, and they keep green till May; all these plants have their time of growing, and their period of rest. These are the months in which the root is employed to take up nourishment, and to convey it to the stalks, the flowers, the seed-vessels, or leaves: but towards the end of May the leaves fade, and nothing else rises till the succeeding September: this is the time of rest in the plant, but not all of it; the fibres are shot out in August for the nourishment of the September stalk, so that the time of absolute rest is the end of May, all June, and the beginning of July. Within this period let the roots be taken up in the native place of the plant's growth: let the earth be taken from them, let them be spread to dry gently, and then tied up in bags; thus they may be sent over to England in their full vigour.

There will be thus no error in taking them up while growing, no danger of their rotting in coming over: they will be kept in the same condition, as if brought from some careful gardener, who had taken them out of the earth in the due course of his profession, and they will grow freely.

They require heat to produce their flowers, and the best management is to plant them in a compost half mould, one quarter rotted wood, and the other quarter sand. In this they are to be carefully planted, and the pots to be set in a hot bed of tanners bark; less heat will keep them alive, but thus they never fail to flourish.

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Striped AMARYLLIS.

This species of Amaryllis deserves an equal place with the former, for though less glorious in the colour, it makes amends by a most pleasing and regular variegation.

The root is an oblong bulb, of a white colour, and from its bottom sends out a multitude of white and downy fibres.

The leaves are large, and of a fine green; they are very long, moderately broad, and hollowed from the centre.

The stalk rises not in the midst of this tuft of leaves, but at their side, and it is roundish, but double-edged, firm, upright, juicy, and in colour purplish.

Its height is two feet and a half, and at its top stands, at its first appearance, a great bud, which afterwards bursting, discloses six or eight noble and erect flowers.

The scabbard which had surrounded them as a general cup in the bud, divides to give them passage, and hangs in purplish fragments from the top of the main stalk, where the flowers take their origin.

These are supported on so many slender footstalks, and each is large, beautifully formed of six pointed petals, and of a snowy white on the inside; their outside is of a less glittering white, and is streaked along with purple; sometimes there runs only one line of this upon the several petals; sometimes there are more, but the others are always fainter than this in the centre; and the tips of the segments are, on their under side, often purplish. The seed-vessel succeeding each, is oval, and contains, in three cells, a number of large seeds.

The colour of the leaves, and the bold and noble aspect of the bunch of flowers, give this plant a magnificent beauty to the eye; but it demands attention on another account; the fragrance is very delightful and very singular, those who recollect the delicate perfume of the Lily of the valley, will be able to form an idea of the scent of these flowers; the smell is of the same kind, but much more exalted.

Culture of the Striped AMARYLLIS.

Experience shews there are not any two of the exotic bulbs which require exactly the same culture, or the same soil. This is a native of the island of Ceylon, and, there, lives in the lower grounds, where it has a deep and mellow earth, and some degree of shelter. The compost that best agrees with it, for we have no simple earth that is fit, is this: mix two bushels of river mud, one bushel of wood-pile earth, and half a bushel of cow-dung; let this be put together in spring, and it will be ready by the time it is wanted.

The proper way of raising the plant is from the bulbs, and to have it in full perfection these must be brought from Ceylon.

They may be taken up with care at the time of the leaves fading, and kept out of the ground two months; after which they should be planted in a pot of light earth, and they will thus come over in good condition.

When they are received here, they should be carefully cleaned, and planted each in a separate pot of the compost thus prepared for them, raising the surface of the mould one inch above the root. When thus planted, they must have a little water, and be set in a bark-bed of very moderate heat; here they will thoroughly root themselves, and they are thence to be removed into the stove, where they will flower with good management, in all the lustre they have in their native country.

The principal care is to pick away dead leaves, to stir the earth now and then at the top of the pot, and to water them frequently, a little at a time, with water which has stood in the stove long enough to be of the same temperature; less heat will keep them alive, and a less careful management sometimes bring them to flowering; but with this they will be surprisingly better than when they have been treated more slightly.

Jacobean AMARYLLIS.

This plant demands the attention of the curious, as one extremely singular, and equally beautiful.

The root is a large round bulb; its outer coat is black,

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The leaves are long, broad, of a firm substance, and of a deep green.

The stalk, which rises on one side of these, is round, but a little flattened, of a delicate pale red and naked. On its top appears an oblong filmy scabbard, pointed at the top, and of a somewhat deeper red than the stalk. When the stem has reached a foot in height, this scabbard bursts sideways, and discloses the flower, whose petals spread in their own way, three drooping, two above them horizontal, and one erect.

Their colour is the most perfect scarlet, and in form they resemble the broad sword our heralds draw in armour.

Within this flower, defended by the three lower petals, appear six filaments and a single style.

The filaments are crimson, and have yellow buttons.

The style is of a paler colour, fleshy, and split into three parts at the top.

The middle one of the lower petals surrounds them half their length, and this petal is in the same manner surrounded by the two which are next it, for more than a third of its length, and as these turn downward, the filaments turn upward.

The seed-vessel which follows is of an oval form, and in three cells contains numerous seeds.

Culture of the Jacobean AMARYLLIS.

The plant is a native of South-America, and in its native climate thrives best, and flowers most boldly where there is a rich earth with some moisture, and with sand enough to make it always free and loose; this must be the guide for a proper compost, and the rest will depend entirely upon the suiting our warmth to its climate.

Let a compost be prepared thus: Mix equal parts of pond mud, wood-pile earth, and mould, from under the turf in a rich meadow; to three barrels of this mixture, add two bushels of coarse sand, and one of rotted cow-dung. This, after repeated trials, has been found to raise the plant preferably to any other natural soil or mixture.

The method of propagating it, is by roots obtained from America, or by off-sets from those in our own gardens; but of these, when they can be obtained, the former is vastly preferable. A flower raised from the American root in the compost here directed, exceeds the common kind, beyond all that an unexperienced imagination can conceive.

We have said that the heat allowed the plant must be proportioned to that of its natural climate; thousands of these roots have been preserved when there were no stoves, but they flower weakly. The regulated heat of a stove alone comes near that of the common air in South-America; and the plant will never rise to its perfection otherwise. The very period of flowering may be altered by this management, and to this alone we can owe so glorious a flower at so dead a season. In nature it throws up the flower-stalk very irregularly, and this way we take the full advantage of her wildnesses.

The season for planting off-sets is in the end of July.

As many pots must be filled with the compost as there are roots, and they must be placed in these with care, and covered an inch and half above the top. These pots should be placed in a warm sheltered part of the garden, and once in four days gently watered.

When the shoot appears, they should be set among the green-house plants, then in the open air, and watered every other evening; after this they must be removed early into the green-house, and thence, at the approach of winter, into the stove.

This is the management of the full-grown roots brought from America, as well as of the off-sets raised here, and thus after having sent up a flower-stalk on one side of the root, in September, they will shoot out another at the end of November, from the other side, and flower in the dead of winter in full glory.

Golden AMARYLLIS.

The root of this plant is large, roundish, black on the outside, white within, juicy, and hung with many fibres.

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The leaves are long and moderately broad, waved at the edges, pointed at the end, and of a deep blackish green.

The stalk is firm, round, and of a pale green. It rises in the midst of the leaves, and is but an inch or two in height.

On its top stands a single flower, large, of a golden yellow, and very beautiful. It bursts from an oblong scabbard, and is upright, hollow and regularly shaped.

The petals are six, broadest in the middle, sharp pointed, and small at the base. Within stand six filaments, crowned with oblong buttons, and in the midst of them a style, with a three parted head.

The seed-vessel which follows the flower is of an oval form, and has three valves, and three cells, with numerous seeds.

Culture of the Golden AMARYLLIS.

Besides the great beauty and singularity of this flower, the ease of its culture is no small recommendation; it is increased easily by off-sets, though raised more successfully by seeds, and in either way requires little attention.

It is a native of many parts of Europe, especially of Spain; it rises there in damp ground very abundantly, and paints the meadows like our Crowfoot.

The soil to be prepared for it should resemble this which it has naturally, and the part of the world wherein it is wild, will inform the gardener that it requires no stove or green-house to bring it to perfection.

In order to cultivate this plant so as to produce it in its utmost perfection, let a compost of the following ingredients be prepared.

A barrow of earth from under the turf in a rich meadow, a bushel of pond-mud, and a peck of old cow-dung. Throw these in a heap all winter, and in spring let them have an addition of some foot; let them be turned up again to the weather, and remain in that manner till August.

This is a compost well suited not only to this, but to many other of the plants brought from the meadows into our gardens.

In the latter end of August let the mould be dug out of a border in a part of the seminary, open to the south-east, and let this compost be thrown in; on this when the surface is levelled, let some seeds of the plant saved with care from the earliest flowers, and such as have blown strongest, be sowed moderately thick; sift over them a quarter of an inch of the same compost, and throw some hawthorn bushes upon the bed.

All the care it will require farther is weeding at times, and watering when the mould is dry. The young plants must be thinned where they stand close, and at two years growth they may be planted out into a bed at four inches distance.

The gardener, when they come to flower, will find among them a great deal of variety, deeper and paler flowers, larger and smaller plants, and broader and narrower leaves. These have been considered by some as the marks of distinct species; but he will know in what manner to consider them when he has raised them all from the same seed.

After this, the better kinds are to be separated, and propagated by off-sets. But we advise the gardener on this, as on many other occasions, now and then to repeat the article of sowing; the trouble is very trifling, and the reward a certain improvement.

Double Golden AMARYLLIS. See plate 1, fig. 2.

This plant most of the writers on gardening call the double autumnal Daffodil; the root is large, bulbous, and covered with a thick skin.

The leaves are five or six, they are broad, not very long, obtruse, fleshy, and of a deep green.

The stalk is round, thick, and three inches high; at its top stands one large flower elegantly doubled and spread open, of the colour of pure virgin gold, from whence the plant derives its name.

The flower is composed of a number of oblong regular petals, broadest in the middle, and obtuse. In the centre stand six filaments, small toward the top, and

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crowned with oblong buttons placed sideways. Underneath the receptacle of the flower, is placed a roundish furrowed rudiment, from which rises a single style with a small head, divided into three parts.

Culture of the Double Golden AMARYLLIS.

In the latter end of March let a bed be made up in a shady part of the nursery, with fresh meadow earth raked clean from stones, and on this let the seeds be scattered with an even hand; sift over them a quarter of an inch of the same mould, and let the ground be defended by an hawthorn bush, and at times gently refreshed with water.

From a quantity of seed well managed at the second, if not at the first sowing, there will be produced one more of these double flowers, which must afterwards be nursed with care, and increased by off-sets.

For these a good bed should be provided in the seminary; they should be separated, if ever so small, every time the old root is taken up, not only for the sake of increasing their number, but to keep that root in the full glory of its flowering.

They must be planted at six inches distance in the nursery bed, and there weeded and occasionally watered, and when the leaves fade, covered with fresh mould, to shelter them during winter; thus they will soon arrive at perfection, and will flower as well as the parent root.

Repeated sowings are advisable, for the sake of obtaining from time to time a succession of these double flowers; for it has been found that, though every necessary care has been taken of the roots, they lose their strength after a number of years, and flower more faintly.

Crimson Oriental AMARYLLIS.

Among all the species of Amaryllis enumerated by Linnæus, this may perhaps claim the preference, both for its singularity and beauty.

The root is very large, round, swelled out in the middle, covered with a thick skin of a brown colour, and sends from the base numerous, very thick and long fibres. The leaves are oblong, broad, obtuse, and of a fresh green with a tinge of greyish.

The scabbard which contains the flowers bursts from the ground entire, very large, oblong, pointed, and tinged strongly with scarlet, or with purple.

As this raises itself above the ground the stalk appears, and by degrees attains the height of fourteen inches; it is flatted, very thick, and of a lively green, more or less covered with that elegant red which was at first so conspicuous upon the covering of the flowers. Before the stalk has attained half its height, the scabbard bursts, and the flowers appear in their large buds close compacted into a kind of conic head. Soon after the covering has burst, they begin to separate, and at length form a vast and very noble head, nearly of a spherical form; some continue erect, or nearly so, while others throw themselves off obliquely, and some hang downwards. These all rise together from the head of the stalk, where there are also placed some reddish films.

Every flower has its footstalk, and these are three inches long, flatted in the manner of the main stem, and tinged like that with a lively red.

The flowers themselves are large, and of a very delicate red; each is composed of six petals, five of which naturally turn a little inward, and the sixth separating from them, stands outward.

This is what occasions Linnæus to call it an irregular flower.

In the centre stand six crimson filaments, crowned with large yellow buttons, and surrounding a single style, whose head is divided into three parts. Each flower is succeeded by a large seed-vessel, and even these make no mean appearance.

Culture of the Crimson Oriental AMARYLLIS.

This elegant and noble species is a native of the East Indies, and with us will never flower so perfectly as in a stove. The seeds are to be obtained from its native place of growth for propagation, or the roots brought thence;

for when taken up at the time of the leaves fading, they will bear to be brought over very well.

The method of propagating it by seeds is tedious and precarious; but if they have been collected in the Indies from good plants, and well hardened, they will keep good, and will grow in a pot of fine mould plunged in a bark-bed; and they must thence be removed into the stove.

The roots brought over from thence, though they also often miscarry, are a better and securer method. When these are received, they must be carefully cleaned, and a pot of a moderate size must be prepared for each of them. Two or three pieces of loose gravel must be thrown into the bottom of the pot, to keep the hole for the discharge of water from stopping up, then the pot must be filled more than half with some of the light rich compost, and the cleaned root set upright, and more of the compost thrown in, till it is covered three quarters of an inch.

In this situation it is to remain, with now and then a very little water, only to keep the mould from being too dry, till it begins to shoot. If the season be favourable, it will do best all this time in the open air, in a warm sheltered place; from the time that it begins to shoot, more water is to be allowed, but still in moderation; and as soon as the weather grows cool it must be removed into the stove, and from this time it must be allowed often a little water. It will thus easily be brought to flower; after a year or two the roots will produce off-sets, and these must be managed with great care.

Every year the old root must be taken out of the pot, and cleaned, and as soon as the off-sets have been taken off, it must be planted again in fresh compost. The best season for this is about a month before the shooting of the leaves in spring.

The off-sets separated from the old roots, must be managed just as those roots were at first; they must be planted with great care in pots of the same compost, and set in a hot bed of bark. The mould in these must be occasionally refreshed with moisture, and a little air must be allowed in good weather.

When they are thus brought to a condition of flowering, they must be taken into the stove, and to keep them in perfect good condition, they must be set in the bark, and continued there throughout their whole time; they will flower any where within the air of the stove, but their full perfection is never seen, unless they are in pots up to the rim in tan, and at times watered.

The season of flowering in this plant, when kept in the stove in this manner, is quite uncertain; but on that must depend the management of the roots, and whole regulation.

Purple Ethiopian AMARYLLIS.

There is scarcely a flower raised superior to this; whether we consider the number, size, colour, or fragrance of the bloom, and very few can be said to equal it.

The root is large, roundish, and of a dusky yellow colour; from its base run many very thick, white fibres.

The leaves are numerous, and they lie scattered irregularly upon the ground; they are very long, moderately broad, of a pale green, and sharp pointed, and they are marked with large longitudinal fibres.

The stalk is very thick, eight inches high, flatted, firm, and of a pale green, often stained with red. There are no leaves nor rudiments of leaves on this, but at its top a membranous scabbard, which contains the flowers. These are numerous, very large, and extremely beautiful; they rise in a kind of conic head, twenty or more in number, and separate to some distance as they open. Their colour in the bud is a pale crimson, stained in different places with purple; but as they open they grow deeper, and when full blown, they are entirely of a strong and fine purple; their scent is in the highest degree fragrant, and towards evening it is overpowering.

Each flower is composed of six petals, of a lanceolated form, equal in size, and opening regularly every way, and there is no cup to them beside the general scabbard.

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In the centre stand six filaments crowned with oblong, incumbent buttons.

The rudiments of the fruit is oblong, and furrowed; it stands underneath the receptacle of the flower, and from it rises a style equal in length and thickness to the filaments, with a small three-parted head.

The seed-vessel when ripe is oval, and formed of three valves; it is divided within into three cells, and in each are many seeds.

Culture of the Ethiopian AMARYLLIS.

It is a native of Ethiopia, and lives there in loose and warm soils; here it will require the choice of such a compost as resembles that kind of earth, and all the assistance of additional warmth.

The roots will bear to be kept out of the ground a considerable time, when taken up at a proper season, and may thus be brought hither from their native country. When they are received, which should be early in summer, a compost should be prepared for them of some of the light kinds, from one of the heaps made up for other purposes, with a fifth part of rotted dung from an old melon-bed.

As many pots must be got ready as there are roots; some loose gravel must be thrown into the bottom, and over this two inches of the mould; upon this the root must be placed, and the pot filled up, so that it may be covered two inches. The pots must then be set under a frame, and the earth at times moistened. The shoot will appear in five or six weeks, and after this they must be watered more frequently, and have more air.

When this has advanced to some height, they must be removed into the stove, where they will flower in perfect beauty.

The flowers do not come forth all together, but in a long succession, so that one plant will be three weeks from the first flower to the decay.

After this the pots must be refreshed every spring with some new mould, the top of that in the pot being taken off for that purpose; and once in two years the roots must be taken up, and the whole quantity turned out. Its place must be supplied with fresh compost, the roots must be cleared, and their off-sets taken away, and planted in other pots, to bring them to a condition of flowering; and this way the plant will be propagated extremely well.

Many-flowered AMARYLLIS commonly called Guernsey LILY.

This plant is no more a Lily than it is a native of the island whence it is named.

It is certainly one of the finest flowers the world produces, and well deserves the care and culture by which it may be brought to flower with us, like other plants.

The root is a large bulb.

The flowers appear at one season, and the leaves at another. These latter are not without their beauty, for their form is regular and pleasing; oblong with a moderate breadth; and their colour a most lively green.

The flower-stalk rises naked from the root and it is a foot and a half high, of a pale green decorated toward the bottom with innumerable spots of a bloody purple; towards the flower it is palest, but often tinged with a light fleshy hue. On the top of this stalk appears at first a long scabbard, serving as a general cup, and when it bursts, there spreads out a considerable number of flowers of the most consummate beauty.

They are large and beautifully formed; each is supported on its separate foot-stalk rising from the head of the main stem in the bosom of the scabbard. The several petals of which the flowers consist, spread themselves wide as if to display their full bloom to the eye; and they are waved a little and turned back.

Their colour is the most perfect red, and they are spangled all over as it were with gold: this with a deep red vein running along their middle, gives them a glory and splendour, when viewed in the sun, superior to that of all other plants.

The filaments are very long, firm, entire, and of a delicate flesh colour, and their buttons are deep purple; the style which rises in the centre is much longer than these; it is beautifully terminated by a stigma divided

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into three parts, and of a purplish colour.

Culture of the Guernsey LILY.

The plant, though named from Guernsey, is a native of Japan; there it flowers wild all autumn in the sands; and from thence it has by some chance been thrown upon the coast of Guernsey, and is an ornament to all its gardens.

The roots are generally brought over thence in the beginning of autumn; and when they have once flowered, are neglected, from a notion that they will not easily be brought to it again, but with the following method they will flower the succeeding years better than the first, and afford off-sets that will also rise to flowering.

Let the greatest care be taken to have the best roots from Guernsey. These should be taken up as soon as the green leaves which succeed the flowers are decayed.

For their reception let the following compost be prepared.

Mix a barrow of mould from a rich dry pasture, with half a barrow of wood-pile earth, a bushel of rotted cow-dung, and half a bushel of river sand; scatter over this a quarter of a pound of salt, and leave it to the weather.

When the roots come over, fill up half way with this compost as many pots as there are of them; set one root on the earth in each, very evenly on its bottom; and fill up the pot with more of the same compost, till the top of the root is covered an inch.

Give all the pots a very gentle watering, and let them be set in a shady place.

Here they are to stand till the shoot of the flower-stalks appear; this will be toward the beginning of October, and they are then to be set out in an open and warmer place, but defended from sharp winds; and here they are to be at times refreshed with water, that has stood some hours in the stove.

The flower-stalk will thus rise to its natural height, and the flowers burst their scabbard and gradually open.

They must then be placed where rains cannot injure them; and where the sun has not too much power; and they will thus continue five weeks in full glory.

These roots may be brought to flower annually, and all that time will be raising a supply for succeeding seasons. To this purpose let them be thus managed;

Dig up a piece of ground in the seminary, big enough to hold all the pots. Set them up to the rim in the earth, as soon as they have done flowering; and place over the bed some tall hoops. Upon these in bad weather draw a cloth, but in milder times let them stand open all day. Thus they will be preserved through the winter; and in summer they are to be managed as already directed in the other species of Amaryllis.

Toward July when the root is preparing for its shoot, let an inch depth of the earth in the pot be taken off; and fresh compost of the same kind put in its place; and every third year let the roots be taken out of the pots, cleaned and placed in them again with fresh compost.

This is to be done as soon as the leaves are decayed, and the off-sets are to be then taken off, and raised in separate pots. They will come to flower in about three years.

AMBER-TREE, *Anthospermum*, a genus of plants ranged by Linnæus among the *Polygamia dioecia*, and of which there are only two species, viz, male and female Amber-tree.

This is considered as a very curious, though at the same time, a very tender plant, and therefore preserved in the gardens of those who prefer variety to trouble and attention. It is however easily propagated by cuttings, during any of the summer months, in a border of light rich earth. They will take root in six weeks time, provided they are watered and shaded as the season may require: then they should be taken up with a ball of earth of their roots, and planted into pots filled with light sandy earth, and may be exposed to the open air until October; at which time they should be removed into the conservatory, where they should be placed as free as possible from being

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over-hung by other plants; and during the winter season, they should be often refreshed with water, but should not have too much given them at one time.

The beauty of this shrub is in its small ever-green leaves, which grow as close as heath; and being bruised between the fingers, emit a very fragrant odour. These plants must be frequently renewed by cuttings, for the old plants are very subject to decay, seldom continuing above three or four years.

It is but of late years, that there have been any of the female plants in the garden, for all those which were formerly in the gardens were males; which being propagated by cuttings had been continued, so that no seeds were ever produced in England till within a few years past, when some seed was received from the Cape of Good Hope, from which I raised many plants of both sexes, and a few among them which have hermaphrodite flowers, which have seeds, from which many plants have been raised.

AMENTACEOUS Flowers, such as have an aggregate of summits hanging down in the form of a rope, or cats-tail: it is also called a *julus*.

AMENTUM, a term used by botanists for what is generally called in English a cat-kin. See the article **CAT-KIN**.

AMETHYST, *Amethystea*, a genus of plants, ranged by Linnæus among the diandria monogynia; and of which there is only one species, viz. mountain upright Amethyst.

It is an annual plant and a native of the mountains of Siberia. It is propagated by sowing the seeds in autumn, in the place where the plants are to remain. When they come up, let them be thinned, and kept clear from weeds; and if they are permitted to scatter their seeds, a new succession of them will arise every year, without any farther trouble.

AMPHITHEATRE, a term used by gardeners to signify certain dispositions of trees and shrubs on the sides of hilly places, which if the hill or rising be naturally of a circular figure, always have the best effect. They are to be formed of evergreens, such as Hollies, Phillyreas, Laurustines, Bays, and the like; observing to plant the shortest growing trees in the front, and those which will be the tallest, behind, such as Pines, Firs, Cedars of Lebanon, and the like. Amphitheatres are sometimes formed of slopes on the sides of hills, covered only with turf, and, when well kept, they are a great ornament to large gardens.

ANEMONE, *Wind-flower*, a genus of plants, in which Linnæus has comprehended not only the Anemone, properly so called, but also the Pulsatella, or Pasque-flower, and the hepatica, or noble liver wort, three distinct genera, according to other botanists; and ranged them among the poliandria polygonia.

There are only six species of the Anemone, 1. The wild or wood Anemone with a large white flower. 2. The wood Anemone with a large red flower. 3. Wood Anemone with a blue flower. 4. Small white flowering Virginian Anemone. 5. Narrow leaved Anemone with a single flower. 6. Broad leaved golden Anemone.

But the amazing number of varieties which culture has made in the colour and structure of the flowers of this genus, have been, by many authors, described as distinct species, and accordingly Tournefort has enumerated no less than one hundred and sixty-eight different species of the Anemone.

The first grows wild in many parts of Germany. The second is a native of England, and found in the woods. The third is also found, growing without culture, in a wood near Wimbleton in Surry, but it is not certain whether they were not originally planted there. The fourth is a native of North-America; and the fifth and sixth grow spontaneously in the east, from whence their roots were originally brought to England; but have been since so greatly improved by culture as to render them some of the chief ornaments of our gardens, during the season when they are in full bloom. These flowers are of a great variety of colours, as red, white,

purple, and blue; and some of them finely variegated with all the above colours. Some of the flowers are large and double, and, when properly managed, are extremely beautiful.

Culture of the ANEMONE.

The month of May is a very proper season for saving the seeds of Anemones, and preparing the compost for them. With regard to the first article, the gardener must distinguish carefully the three kinds of Anemones, as they are characterised by the condition of the flower, the single, the semi-double, and the double. With this first distinction in his memory, let him go over the beds of Anemones in full flower, and select plants for seed. The seeds of the single are excellent for the production of the common semi-double, and some double flowers. These have the full strength of nature, but they are not to be selected for the present purpose, because more time and re-sowing would be required. The seeds of the double flowers are not fit: many of them ripen more, and in those which do, they are weak and often imperfect.

This throws the choice upon the semi-double flowers, that is, on such as have some series of small petals within the large, yet have not the whole body filled with them, but have plain, conspicuous, and vigorous heads of seeds in their centre, surrounded by threads, with fair and perfect buttons.

From these flowers perfect seeds may be obtained, and they have not the first change to pairs, as they must, if the flower in which they were ripened had been absolutely single.

Among the semi-double flowers which have this character, let him select such as have upright, tall, and strong stalks, and have the flower large and well coloured.

These let him mark with sticks; tying up the stem, to prevent the wind having too much power upon it, and then ripen the seed with all possible attention.

To this purpose, let him take up the roots that are nearest these; strew a small parcel of some light rich compost about the plants, and every evening give them a gentle watering. As soon as they are marked, let a compost be mixed up for the seed of the following ingredients.

A barrow of rich mould from under the turf in a dry hilly pasture, a bushel of river mud, three pecks of rotted cow-dung, of hard large sand, and of earth from under a wood-pile, each a peck and a half.

Throw these in a heap, and once in ten days turn them, working them well together to break the clods, mix the ingredients, and prevent the growth of weeds.

This will be preparing while the seeds are ripening.

When the heads have acquired their bigness, leave off watering the plants; and as soon as they begin to be loose upon the summit, cut off the heads with a piece of the stalk, and lay them on a papered shelf to harden.

After a week or ten days separate the seeds from the head; let them lie a week more to harden, and then paper them up for sowing.

In the second week of August chuse a part of the seminary that is open to the south-east, and is upon a rising part of the ground. Dig out the mould, fill up the place with the compost, and lay the surface level.

Mix with the seeds six times their quantity of dry pasture mould, and let them be perfectly blended with it, so as not to lie in clusters together. Then sow them with this mould carefully upon a bed, in a still calm evening; sift over them a quarter of an inch of the compost, and lay upon the bed some hawthorn bushes; not to cover it up close but to defend it from injuries.

Every day, an hour before noon, draw a mat over the whole bed. The bushes will support this, and give air underneath. Let it be removed at four in the afternoon, and when the weather is cloudy let it be wholly omitted. The only purpose of this shelter, is to prevent the too powerful effect of the mid-day sun at that season, which would dry up the compost to absolute dust, and burn the seeds.

If no showers fall, the bed must once in ten days be watered: but in this there will be great care required. If it be done in a hasty manner, half the seeds will be washed out of the ground.

A small pot, with a fine nose, must be used, and this so managed, that the water may fall softly upon the surface, like a gentle shower, refreshing and moistening the earth, without disturbing it.

The bushes are all this time to remain on the ground, except it should be necessary to remove them, to pick out any chance weeds.

The first week in October let them be taken away entirely, and let a couple of reed hedges be hung on hinges, at the north and east ends of the beds; these must be drawn in to defend the ground in severe weather, but at other times left open.

In the middle of October the young plants will appear; the bed must then be carefully weeded, and if they grow too close in any part, they must be thinned.

Two or three hoops must now be placed over the bed, and a canvas or mat be laid in readiness to draw over it on occasion. With these defences prepared in time, the plants will be kept alive through the winter. The bed must be now continually weeded, that not the least shoot of any thing may be seen upon it but the plants.

If gentle showers fall, they must be admitted freely to the ground: if it be a season of drought, their place must be supplied by waterings; but when heavy rains fall, the canvas, or mat, must be drawn over the hoops, to shelter the young plants from them.

This is necessary on two occasions: for these hasty showers, which fall with violence, will often wash away the mould from the tender roots to their certain destruction; and often, so much wet will settle on the bed, as lying about the tenderest fibres, will rot them, or the first frosts of winter following them, will have the more effect upon the mould, from its wetness, and will harden it in clods, with cracks between, which will admit the cold air, and destroy them. This is the care needful in regard to rains.

In frosty weather the mat, or canvas, must be drawn over the hoops every evening, and removed every morning: or when very severe kept on all day; and against the cold and nipping winds of early spring, the reed fence is to be turned upon its hinge, according to the quarters from whence they blow.

Thus will the plants be preserved in vigour through the winter. In spring they must be kept carefully weeded, and as the summer advances, sometimes gently watered.

In June the leaves will decay. Let the roots then be carefully taken up.

Let the compost be dug out, and a fresh quantity, prepared for the purpose, be put in, and let the bed be enlarged, so that it may hold the roots at a due distance.

Let the surface be levelled, and lines drawn across and length-ways, at four inches asunder: and in the centre of each square, place one root with the bud upwards; sift over these half an inch of mould, and manage them in respect of weeding and watering as at first, placing the reed-fence to the southward, to shade the ground from the full sun.

The third week in October give the bed a very careful and perfect weeding: then sift on half an inch more of the compost, and defend it as the former winter.

Early in the spring the young plants will appear very vigorous and strong, and a great many of them will flower.

The gardener is not to judge of their value from these their early and maiden flowers: they will often promise a great deal, but their perfection is in the succeeding seasons.

This spring let a larger quantity of compost be prepared, and let the plants now be well attended.

When the leaves are decayed, let them be taken carefully out of the ground, clean them from the mould that hangs about them, pick away the decayed stalks, and then spread them upon a mat in an airy room, where the sun does not shine in.

When they have lain here long enough to harden, pick off any mould that might be left about them at first: tie them up in small bags, not too many together, for fear of their gathering damp, and hang them up out of the way of accidents, or vermin.

The last week in August chuse a place in the flower-garden for planting them: let it lie open to the south-east, and defended from the full east and north, mark out a space sufficient for the roots, and dig away the mould three quarters of a spade deep; bring in the compost prepared for this purpose of the same ingredients, and in the same manner as the first.

Throw it into the place, and lay it twelve inches thick, levelling the surface.

Thus let it lie ten days, then break it lightly with a spade, half spade depth, and rake it even; draw away all clods and stones, and on the clean bed draw lines lengthways and across, six inches distant.

Take the roots out of their bags, and place one of them carefully in the middle of each square; sift on more of the compost, and cover them two inches and a half. Care must be taken that the bud of the root lies uppermost: and the surface of the bed must be now finished with a fine rake, laying it a little rounding, to throw off the water.

If no showers fall within a week after their planting, let the whole be gently and regularly watered, and the more curious sorts managed with great care.

Heavy rains and high winds would greatly injure them: and the sun, if permitted to shine upon them fully, would, in a very short time, cause them to decay.

In the month of May they should, therefore, be screened from all those occasions, by a covering of hoops and mats; this will not only preserve the beauty of the flowers, but will continue them a longer time in bloom.

The hoops must be kept constantly over the beds, and the mats, or canvas, should always be in readiness, in order that they may be soon drawn on, whenever it is necessary for the defence of the flowers.

The hoops which should now be erected pretty high, should be nailed across to stakes about a yard high, fixed at due distances, on each side the bed.

When the plants are in bloom, let the mats be drawn over the hoops every sunny day, about nine or ten o'clock, and let them remain till four or five in the afternoon, and then take them off again.

The mats must also be drawn on at all times when it rains hard, and when the winds are strong, for such weather would beat down the flowers, and break their stalks.

The flowers should also be sheltered every night, when there is an appearance of bad weather. And the mats, or canvas, be always ready for drawing over the hoops, when there is occasion to shelter the plants.

The mats should be drawn over every day, when the sun shines, about nine or ten in the morning, and should be taken off about four or five in the afternoon. The mats must also be drawn over the hoops, to defend the flowers from heavy showers of rain, when such at any time happen.

Where this sheltering and shading these kinds of flowers is duly practised, it will preserve them a long time in their fullest beauty, at least a fortnight longer than if they were to be fully exposed: and they will also be much finer.

Remember that the hoops which are fixed across the bed for the support of the mats, be not too low, for that would draw the flower-stalks up weak, and render the colours of the flowers very faint.

The best way to preserve the bloom of these plants without weakening them, is as follows: but it must be done in the beginning of April.

On each side of the bed let some stout stakes be fixed upright in the ground, at twenty inches, or two feet distance from each other, and let each stake be three feet high; to these let hoops be fixed cross the bed: the covering of mats, or canvas, are to be drawn over them

occasionally, and there will be air sufficient to preserve the flowers strong, and their colours lively.

Some persons who are remarkably curious, erect an awning, or shade, of hoops and mats over these flowers, high enough to walk under, taking care that the mats come low enough on the sides, to keep the sun from darting upon the bloom.

ANISE, *Anisum*, one of the species of the *Anagallis*, or Pimpernel; it is an annual plant, growing naturally in Egypt, but cultivated in the southern parts of Italy, from whence the seeds are annually imported into England.

The lower leaves of Anise are divided into three lobes, deeply indented on their edges; the stalk rises to about a foot and a half in height, dividing into several branches garnished with narrow leaves, cut into three or four narrow segments, terminated by pretty large loose umbels, or rays, standing upon pretty long foot-stalks. The flowers are small, and of a yellowish white: the seeds are oblong and swelling. The seeds of this should be sown the beginning of April, upon a warm border, where the plants are to remain; when they come up they should be thinned, and kept clean from weeds, which is all the culture this plant requires, but it is too tender to be cultivated in England for profit.

ANGELICA, a genus of plants, which has no English name. It is ranged by Linnæus among the *pentandria digynia*: and contains four species; 1. Angelica, with leaves composed of an unequal number of lobes, or the common garden Angelica; 2. Angelica, with equal, oval, spear-shaped, sawed leaves; 3. Angelica, with the extreme part of the leaves joined, and terminated with a foot-stalk; 4. Angelica, with equal, oval, cut, and sawed lobes to the leaves.

The first species of this genus is a biennial plant, which grows naturally in the mountains, and by the sides of the rivers of Lapland. It is propagated by seeds, which should be sown soon after they are ripe, in a moist soil. When the plants are about half a foot high, let them be transplanted at three feet distance one from another; the second sort is a perennial plant, and a native of this country, and most others in the north of Europe; but is never cultivated in our gardens; the third and fourth species are natives of Canada, and are biennial plants, which may be propagated, by sowing their seeds in autumn, and managing them afterwards in the manner directed for the first sort; they are seldom admitted into gardens, but for the sake of variety.

Berry-bearing ANGELICA, *Aralia*, a genus of plants, ranged by Linnæus among the *pentandria pentagynia*: and of which there are four species; viz. 1. Berry-bearing Angelica, with woody, prickly stalks, and unarmed, hairy leaves; 2. Berry-bearing Angelica, with prickly stalks, and unarmed hairy leaves; 3. Berry-bearing Angelica, with a leafy, herbaceous, smooth stalk; 4. Berry-bearing Angelica, with a naked stalk.

The first species grows naturally in Virginia, and is generally propagated by seeds, which as they do not ripen in this country, must be procured from North America. They should be sown in spring, in pots filled with light earth, and placed in a shady situation. Let them be kept clean from weeds, and in the autumn following plunged into an old bed of tan, or placed in a warm sheltered border.

In a severe winter it will be proper to cover them with straw, or pease-haulm; and in March let the pots be plunged into a moderate hot-bed. When the plants are come up, they should frequently be refreshed with water, and constantly kept clean from weeds. In May they should be inured to the open air; and when they are removed out of the bed, they should have a shady situation. In October the pots should be placed under a frame, to protect the plants from hard frosts; but in mild weather they ought to have the free air. In spring, before they begin to push out their leaves, they should be carefully taken out of the pots, and separated. Part of them should be planted singly into small pots, and others may be planted in a bed of light earth in a warm situation. Those planted in pots should in the following summer

have a shady situation, and the next winter be sheltered again. The spring following they may be shaken out of the pots, and planted where they are designed to remain. Those planted in the bed will require to be protected from the frost the first winter, by covering the surface of the ground with old tanners bark; and in hard frost some straw, pease-haulm, or any light covering, should be laid over the bed. These plants may be continued two years in the bed, by which time they will be strong enough to be transplanted to the places where they are designed to grow.

This plant may also be propagated by its roots: for as they spread far into the ground, so if they are laid open, and some of the strongest are separated from the plant, and left in the ground, they will put out new stems; or if part of the roots are taken off, and planted on a moderate hot-bed, they will push out the stems in plenty, and so may be easily increased.

The second sort is a native of China, and may be propagated in like manner.

The third and fourth species are natives of North America, and are perennial plants, easily propagated by sowing the seeds in autumn. When the plants are come up, let them be kept free from weeds; and in the autumn following, soon after their leaves decay, be transplanted into the places where they are to remain. They may also be propagated, by parting of their roots in autumn, and planting them at a good distance, one from the other. The plants are hardy, and will thrive in any soil or situation.

Early-Shrub ANONIS, a very elegant plant, of which there is no English name, ranged by Linnæus among the *diadelphia decandria*, and called by that author Ternate-leaved Anonis, with clustered flowers, placed usually in threes, and with films to the base of the leaves, surrounding their stalks.

This beautiful plant is regular in its growth, raised with little trouble, and valuable, at once, for the early appearance of its flowers, and for their long continuance.

The root is brownish, tender, and furnished with many long and straggling fibres.

The stem is round, firm, and two feet and a half high, branched from the bottom to the top, and forming itself naturally into a handsome shrub.

The bottom is often purplish: the branches are of a greyish green, and they are slender, tough, and pliable.

The leaves are placed at distances, in a wild and irregular, but not displeasing manner. They rise three together: but often there will be one or two tufts of young ones in the bosom of the elder, so that the whole cluster amounts to six or nine. They are long, narrow, obtuse, and elegantly serrated at the edges.

Their colour is a fine fresh green, and their rib is often purplish: usually there is no footstalk; but on the lower part of the plant, in some places, there is a short one, supporting the three leaves, with a film at the base.

The flowers are extremely elegant; they are large, and are disposed in considerable tufts, terminating all the branches. Usually three grow upon one foot-stalk, and there will be five or six, such as at the top of each branch.

Their colour is a lively crimson on the outside; within they seem painted by a curious hand, with lines and streaks of white; and the very cup, from whose hollow they rise, is reddish.

The student, viewing all more closely, will find the construction very elegant and singular. The cup is hollow, formed of one piece, and divided at the edge into five pointed segments, which turn upwards.

The flower is regularly papilionaceous, and is composed of four unequal petals. The vexillum is large, of an oval heart-like form, and depressed at the sides; the Alæ are oval, and half as long as this; the Carina is pointed, and longer than the Alæ.

In the body of the flower are lodged ten filaments: nine of them coalesce for a great part of their length, and there is a tenth naturally loose: but sometimes this

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will be united also with them; the ends are free, and are turned up, and they have small buttons.

The style is single, and terminated by a roundish small head.

The seed-vessel is a short hairy pod, in which are a few kidney-shaped seeds.

The coalescence of nine among these filaments, and the one remaining single, shews the plant to be one of the *Diadelphia Decandria*; the class and section of most papilionaceous plants.

Culture of this ANONIS.

It is a native of the southern parts of France, and of some other European provinces; with us it requires no peculiar care or defence, the open ground will preserve it, and being once rooted, it will endure many years, and be every season stronger, and better furnished with bloom.

It should be raised from seeds, and the soil should be such as nature shews it best loves.

In France it flourishes best wild, in high and barren grounds, where there is depth of mould.

Its long fibres spread far, and pierce deep, so that they find resources of nourishment, where the eye sees only barrenness.

Let the gardener fix upon a dry warm spot in his ground, and take out the mould three spades deep. Let him throw into the place some dry pasture earth, mixed with a little foot, and a good quantity of old cow-dung.

Let him cover this an inch with the common mould of the border, and upon that surface scatter some of the seeds, in the third week in September.

Let these be covered with a straw's breadth of fine mould sifted over them, and let him throw a few bushes over the ground, to keep off accidents.

When the young plants appear, free them from weeds, and give them in a morning, once in four days, a gentle watering.

In spring thin them to a foot distance, taking up the weakest plants, and after this weed them carefully, break the earth boldly between them with a trowel, for they root deep, and every other day give them a gentle watering. Take off the lower side shoots, to train them with a little stem, and they will rise to their due height the first season, and flower vigorously.

Let none stand this year for seed; take off the heads as the flowers fade, and the plants will by this continue flowering three or four months. Gardeners think this exhausts the roots, but they err; it is the ripening of seeds that weakens this kind of plant, not the most profuse flowering.

The plant thus established in the ground will require no more care; but it will every year be more beautiful.

ANTHERÆ *Apices*, or *Summits*, the little knobs or tops in the middle of a flower, supported by the stamina, or chives, being the seed-vessels in plants, and containing small oval particles, of various colours, supposed to be a kind of male sperm, which when ripe impregnates the flower, and renders it fruitful.

ANTHOLIZA, a genus of plants for which there is no English name. It is ranged by Linnæus among the *triandria Monogynia*, and contains two species; 1. Antholiza, with one declining stem, generally called Scarlet Antholiza; 2. Antholiza, with all the stamina descending.

The first species is a very beautiful plant, and has withal a singularity that attracts every eye, and never fails to please.

The root is large and fleshy, the leaves are of a singular form; they are long, narrow, sharp pointed, ribbed length-ways, and in all respects of the kind we call grassy; but that they have short footstalks: from these they rise hollow at the base, and grow broader as they continue their course, to a third part of the length, whence they grow narrow again.

The stalk rises in the midst of these, and is round, hairy, and a foot and a half high.

The flowers grow in clusters from the sides of the

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stalk; they are placed on short footstalks, surrounded by some small membranaceous leaves at the base.

They are very large, and of extreme singularity and beauty. Their colour is on the outside a very elegant pale red, and a deep blood red within. They are long, large, hollow, and have an upright lip.

The seed-vessels are three-cornered, and the seeds are numerous and large.

It has no cup beside the few irregular leaves before named, which serve to separate the several flowers that grow in the same cluster.

The body of each flower is formed of a single petal; this is small and tubular at the bottom, it thence rises to a considerable height, extending all the way in breadth; but it is not in this part rounded, but flatted; at the top it forms a kind of gaping mouth, composed of two very irregular lips.

The upper lip is long and narrow, undulated, and strait, and has two small segments at the base. The under lip is short, and is divided into three parts.

In the body of the flower are lodged three filaments, they are very long and slender, and are terminated by pointed anthera.

Two of these follow the course of the upper lip, and one is placed in the lower. The style is single, and is placed with two upper filaments, and at its top splits into three capillary segments, which turn downwards.

The extreme singularity of this flower will not prevent the student from perceiving to what class in the Linnæan system it belongs.

It is a native of Africa, and grows there in sands near rivers. This shews what is its proper culture.

The roots which bear to be kept without damage a considerable time out of the ground, are to be obtained from their place of growth, and about June put into a light-rich earth in large pots.

The best compost will be this: mix equal parts of fresh mould from a pasture, common sand, and the earth from under an old wood-pile.

With this fill the pots about two thirds; then place the root, and put in more of the same soil, till it is covered an inch deep at the top.

Give it a gentle watering and set it in a warm sheltered place. In August the leaves will appear; it must then be removed where there is more sun, and watered lightly every day.

In September it should be set in a stove and allowed a temperate heat, and still be moderately watered. This conduct will bring it to flower in all its beauty.

APOCYNUM. See the article **DOGSBANE**.

APPLE-TREE, *Malus*, a genus of trees too well known in England to need any description here. Linnæus has ranged it among the *pentagynia icofandria*, and considers the Apple-tree, Pear-tree, and Quince-tree, as species of the same genus.

Among all the variety of fruits cultivated in England, none are so universal as the Apple; for every species of soil will produce great quantities of one or other of the varieties of this fruit.

It would be almost endless to enumerate all the various kinds of Apples which ripen in the summer months, and have their peculiar names by which they are distinguished, as the Margaret Apple, the Jenneing, the Codling, the summer Permain, &c. Other sorts are eatable in winter as the Golden Pippin, Nonpareil, winter Permain, and a great number of others. Besides these there are several others which are preferred for making cyder, the chief of which are the Red-streak, Devonshire-wilding, the Whitfour, Herefordshire underleaf, John Apple, everlasting Hanger, Gennet may be, and several others.

From the great variety of Apple-trees, we have a vast number of fruits in our gardens owing solely to culture. The several sorts of Apples are designed either for standards, or in dwarfs or espaliers; those that are designed for standards should be grafted on crab-stocks, and those for dwarfs or espaliers on the Codling; or some other sort which does not shoot freely.

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The best season for planting out these trees is, if the soil is dry, in October; but in a wet soil it is best to defer it till February. The distance at which they should be planted, is forty feet square, that the sun and air may have room to come every way at them. And it is a very good method in large orchards, to plough and sow the ground between them, till they are grown up. Good thriving trees, of about three years grafting, are to be chosen for planting; and they should be taken from a soil as nearly of the same nature with that they are to be planted into, or rather from one that is something poorer. In preparing these trees for planting, all broken or bruised roots are to be taken off, as also all such as cross or gall one another, and all small fibres; for they seldom survive a removal. Some of the most luxuriant branches must also be taken off at the same time, and others shortened, but the head should by no means be cut off. The holes for the planting them should be made about two feet deep, and of a breadth proportioned to the extent of the root; the bottoms must be made even, and the clods and lumps broken. The tree is then to be set in the middle of the hole, and placed as upright as possible, and the earth carefully placed about its roots; and finally trod about it with the feet, and if the weather be dry, every tree should have a good watering, which will fix the earth to the roots. A stake should also be fixed by the side of each tree to tie it to, that the wind may not shake it and loosen the roots. The foot of each tree should be then surrounded with turf newly cut, with the green side downwards, which will greatly help to keep the earth moist; and if the season be very dry, the waterings must be more frequent; but it is a very common error to water new-set trees too much, and this should be carefully avoided. The year afterwards dig in the earth about the roots, and bury the rotied turf, which was laid about the root when planted, and there needs no farther care, the orchard will then thrive of itself. Dwarf standards are of the least value of all Apple-trees, never producing well-tasted fruit; and therefore the worst way of managing this tree. Espaliers are planted to surround the quarters of kitchen gardens. These quarters should be made as large as the garden room will permit. The trees should be planted at sixteen or eighteen feet asunder, if on crab-stocks; but if on paradise stock, twelve feet will be sufficient; when these are planted in the manner above described, they should be headed to about four eyes above the graft, and they should never be of more than two years old from the grafting when planted. The summer after they are planted, a number of small stakes must be provided, of about three feet long, to drive into the ground on each side of the trees, four to each tree; and to these stakes the new shoots must be fastened as horizontally as possible. If the trees have taken kindly, probably about Michaelmas all the four eyes will have made shoots; if so, at Michaelmas, which is the right time for pruning, the two upper shoots should be cut off to four eyes each, but the undermost may be left with six or eight; but the branches should never be shortened in summer unless on occasion of filling up some vacancy in the espalier, and then this must not be done after May. In the second year all the shoots must be trained horizontally, except the fore-right ones, which must be displaced as fast as they are produced: at Michaelmas, the branches in the middle of the tree, or wherever there is a want of wood, must be shortened; but after this be very careful of any great lopping or shortening of branches but leave them at full length, training them all horizontally.

Custard APPLE, one of the species of the *Annona*, found in the West-Indies, and the warmer parts of North-America. This tree grows to the height of twenty-five or thirty feet in the West-Indies; and produces a very large fruit of a conical form; and, when ripe, of an orange colour. It is full of a soft, sweet, yellowish pulp of the consistence of a custard, and from thence it has its name. It is too tender to live in the open air in England; but may be easily raised from seeds in bark stoves; but will not produce fruit in this climate.

Love APPLE, a species of the *Solanum* or Night-

shade, with an herbaceous stalk, cut, winged leaves, and single bunches of flowers. It is a native of North America, and may be propagated by cuttings, which, when planted, must be covered with a glass, or hand bell, and shaded from the sun till they have taken root and then treated in the same manner with other exotics.

Mad APPLE, a species of the *Solanum* better known by the name of Egg-plant. See the article EGG-PLANT.

Thorn APPLE, *Datura*, a genus of plants, ranged by Linnæus among the *pentandria monogynia*, and of which he enumerates three species. 1. *Datura* with a spiny, erect, oval fruit. 2. *Datura* with a spiny, nodding, globular fruit. 3. *Datura* with a smooth, nodding fruit, and a ligneous stalk.

The first and second species are annual plants. The first was originally a native of America, but is now common in almost every part of Europe, as it will grow wherever the seeds are sown; and if the plant is permitted to scatter them, a plentiful supply of young plants will come up. The second species grows naturally in Asia and Africa, and will therefore require an artificial heat in this climate. Accordingly the seeds of this species must be brought forwards by means of a hot-bed in the spring; and in June the plants may be set in a warm border of rich earth, where they will flower in July and August; and, if covered with glasses will ripen their seed in this country. The third sort is a shrubby plant, and a native of Peru. The seeds must be sown on a gentle hot-bed, and the plants afterwards heated in the same manner as other exotics.

APRICOT, the name of a well known species of fruit trees, ranged by Linnæus with the *Prunus*, or plum-tree, and ranged among the *icosandria monogynia*. But though the generative parts of the flowers agree according to his system of botany, yet as there is a very material difference, not only in the plant and foliage, but also in the taste and form of the fruit, we shall consider these trees distinctly.

The Apricot tree grows in England, to a tolerable size, producing roundish, accumulated leaves serrated at their edges, and placed alternately on free-growing branches, though on the cufsons or spurs, they grow five or six together in a bunch. The flowers, which are rosaceous, appear early in the spring before the leaves, and are succeeded by a well known, fleshy, succulent fruit. In England there are seven sorts cultivated. 1. The masculine Apricot, which is soonest ripe, and of a small roundish form. 2. The orange Apricot, which is the next that becomes ripe, the flavour of which is very indifferent. 3. The Algiers Apricot, the next that ripens, which is oval-shaped, compressed, and of a straw-colour; this fruit is not much esteemed. 4. The Roman Apricot, next in order of ripening, and larger than the Algiers. 5. The Turkey Apricot, which is larger than the others, and of a globular form, it ripens next, and is much better flavoured than any of the above-mentioned. 6. The Breda Apricot, supposed to be a native of Africa, it is a large, roundish fruit, of a deep yellow when ripe, and of an orange colour within side, the flesh is soft, full of rich juice, and higher flavoured than any of the whole tribe. 7. The Brussels Apricot, it is the last in ripening, is red on the side next the sun, and of a greenish yellow within side when ripe; the flesh is firm and high flavoured, but often cracks before it is ripe.

All the sorts of Apricots are propagated by inoculation on plum-stocks, and trained in the nurseries either for planting against walls, or for standards. The best soil for these, or any other sort of fruit, is fresh untried earth, from a pasture taken about ten inches deep with the turf, which should be laid to rot and mellow, at least twelve months before it is used. When the former soil of the border is taken away, this fresh earth should supply its place, and if the borders are filled with it two months before the trees are planted, the ground will be better settled, and not so liable to sink after the trees are planted. The ground should be raised four or five inches above the level to allow for settling. The borders being thus prepared, make choice of such trees as

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are of one year's growth from the budding, and if the soil is dry, the best season for planting them is in autumn when the leaves begin to fall. They will then have time to form fresh roots before winter, be better enabled to withstand the severity of the weather, and prepared to shoot more vigorously in the spring.

Do not cut off any of the head at the time of planting, unless there be any strong fore-right shoots which will not bend to the wall, and must therefore be taken away. If the soil is very moist, it is better to plant in the spring, just as the sap begins to be in motion, the trees being ready prepared for planting, by cutting the extremities of the roots smooth, and all small decayed fibres off; mark out the distances they are to be planted at, which in a good strong soil, should not be less than sixteen or eighteen feet; make a hole where each tree is to stand, and place the stem about four inches from the wall, bending their tops towards it.

After having fixed the tree in the earth, nail the branches to the wall, and pour a pail of water on the root, in order to settle the earth more compactly about it: then cover the surface of the earth round the roots with dung, to keep out the frost. In this state let them remain till February, when, if the weather is fine, the branches should be unnailed, and with a sharp knife cut down to about four or five eyes above the place of inoculation, sloping the place of incision towards the wall. When the weather becomes hot and dry, it will be necessary to water them, observing to keep some mulch round the roots, which will prevent their drying too fast.

As new branches are produced, observe to nail them to the wall horizontally, and displace such shoots as grow in a fore-right direction: this must be repeated as often as necessary, but by no means top the branches in summer.

In autumn, when the leaves are dropping off, it will be necessary to shorten the branches in proportion to their strength. A vigorous branch may be left eight or nine inches long, but a weak one not above five or six. By this means no part of the wall will be left uncovered, with bearing wood, which must be the case, if the branches are left at their full length at first, which is practised by some gardeners; but the error must be exposed, when it is seen that few more buds than two or three shoot from the branches, and these are generally produced from the extreme part of the last year's wood, so that all the lower part of the shoots become naked, and this is the reason we see so many trees, which have their bearing wood situated only at the extreme part of them. The second summer observe as in the first, to displace all fore-right shoots, nailing the others close to the wall horizontally, and never shorten any of the shoots in summer, unless to furnish branches to fill vacant places on the wall. At Michaelmas shorten the shoots as before directed; the following years management is much the same as the preceding: observing that Apricots produce their fruit not only on free growing branches, but also on cufsons, or spurs, which are produced from two years wood; these spurs, therefore, should not be displaced.

Apricot trees planted against a wall, of a west or east aspect, is best, as a south aspect, is rather too hot for them.

The west aspect is preferable, for it generally happens that at the time of their being in bloom, the blighting easterly winds prevail, which frequently cut their blossoms off, and greatly damage the trees.

The Brussels and Breda Apricots are most commonly planted for standards, and produce fruit of a much richer flavour than those planted against walls; the misfortune is, that by blowing so early, the flowers are very apt to be destroyed by the inclemency of the weather: therefore, instead of training them with stems, six or seven feet high, it would be better to have them about half that height: or they may be placed as dwarfs in an espalier, where, if properly managed, they will produce good fruit, and the trees in espalier may be more conveniently covered in the spring, when the season proves bad.

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For a further account of the management of these trees, see the article PRUNING and INOCULATION.

APRIL, the fourth month of the year.

In the flower gardens and parterre, you may, about the beginning of this month, sow, in the natural ground, the most hardy exotic seeds, and such flower-seeds as you have omitted to sow in the preceding month. The part of the garden, where flowering shrubs are planted with roots and flowers among them, should now be dressed, and the ground should have a good cleaning. Clear away weeds, take off all rubbish, broken and straggling branches, and break up the whole surface of the ground, drawing up a little mould about the heads of the plants, and round the stems of the shrubs.

Now is the time to make fresh hot-beds to forward such young seedlings of exotic plants, as are come up, and fit to transplant from the first hot-bed. Roll your grass and gravel-walks after rain, rake over and renew your works in sand, &c. and let your grass be often mowed. If evergreens are wanted, let them be brought in before the end of the month, upon the evening of a cloudy day, and immediately planted. The annual plants in their hot-beds should now by degrees be inured to the weather. The hardiest flowers, which will now open in the common borders, and be in flower, should all be cleared and put in order; and the latter end of this month the borders should have such a thorough cleaning, that not a weed should be left. The beds of choice flowers must also be kept perfectly clean.

In the seminary dig the ground well, and scatter, or plant the several exotic seeds, according to their kinds and size, and get to work upon removing exotic trees: for which purpose, chuse a time when there is a prospect of rain, damp air, and a southerly wind, and begin with the hardier kinds. If easterly winds come on unexpectedly, let a reed hedge be placed to defend them; and if the expectation of rain be fruitless, let them be watered every day. The beginning of this month you may safely transplant most sorts of evergreens, and graft Hollies; and about the middle of the month you may inarch Firs, Pines, Junipers, and other trees.

Look over the buds that are now shooting, and where you observe their tops infested with insects, and their leaves curled, you should pull them off before the injury spreads too far. Look over the seed-beds of the last year: the first shoots of many of the shrubs and trees will appear. Cherish these by drawing a little mould about them, and clearing away weeds; give gentle waterings: and where they are of the tenderer kinds, if the nights prove severe, allow some covering; the best is a frame of high hoops, and a covering of canvas, which must be taken off in the morning. If the beds open to the east, a reed-hedge must be placed for their defence. Keep the ground clean between the rows of trees in the nursery, and if the season should prove dry, you must diligently water your seed-beds of evergreens, forest-trees, and shrubs; as also the young plantation, which were drawn out of the seed-bed, and the stocks for fruit-trees, which have been lately planted. Finish the sowing of biennial and perennial plants. Look over the beds of shrubs transplanted from the seed-ground, and if showers do not fall, water the beds once in three or four days, and weed the autumnal beds of trees and shrubs.

In the fruit garden, the trees being in their bloom, little is to be done in this month; but you are now to rub off such young shoots of new planted trees against walls, as push directly forward, leaving none but those that shoot side-ways, to form the beauty of the tree. What has been directed to the other shrubs, may be continued to the fruit-trees of several kinds. The plantation of fruit-trees should now be finished; if any article be unfinished in the pruning, let it now be completed. Insects begin now to hatch upon fruit-trees, and too much care cannot be taken to destroy them. Look over the fruit-trees inoculated last season, cut off the upper part of the stock, and let the ground be stirred about the roots. All new planted trees are to be encouraged with water, and should either have a semicir-

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cular paving of small stones, or else a small heap of weeds or grass, laid to keep them cool and moist. Keep your garden clean, and digging borders half-spade deep, and stirring the earth about old wall-trees, is a very good culture, and the most effectual method to destroy the weeds. Your fruits in the forcing-frames, must sometimes have fresh air, in proportion to the heat of the weather, and their branches should frequently be sprinkled over with water, and their roots should now and then have some watering.

In the kitchen-garden Cauliflower plants remaining in the winter beds must now be planted out. Sow a small crop of Carrots, and another of Onions, and some of the kitchen garden plants of slighter service, as Burnet, Chervil, Bugloss, and Borage; sow also Marygold, Spinach and French Sorrel, plant Winter Savory, and other of the hardier kinds that grow from slips, allowing them a rich piece of the ground under shade and shelter; plant also Sage and Rosemary, Hyssop, and most of the aromatic plants; as also Mint, Baum, and Penny-Royal. Plant out the Lettices sown in autumn; plant Asparagus beds for the roots are now just shooting, and they never take so kindly as when planted at that period. About the middle of this month you should sow some Purslain, and the larger peas should now also be sown for a full crop. Towards the end of this month sow Hyssop and Sweet Marjoram, Thyme and Summer Savory. Radishes should also be sown. Pease and Beans sown and planted. Once in six days let a small piece be dug for salletting, and plant sticks for those rows of Pease which require it. Prepare ridges for cucumbers and melons, that are to be raised under bell glasses. Put a crop of French-beans into the natural ground. Defend the trees and plants from snails and slugs, which in this month make great destruction in the kitchen garden. Keep all your young crops clean from weeds; for if at this season that work is neglected, it will require much more labour afterwards, and the crops will be greatly injured by the weeds.

Particular directions for the culture of each plant, and the various management of plants, fruits, roots, &c. will be found under their respective names.

ARBOURS, are generally made of lattice-work, either in wood or iron, and covered with elms, limes, horn-beams, or with creepers, honey-suckles, jasmines, or passion-flowers, either of which, if well managed, will answer the purpose. Arbours were formerly in much greater esteem than they are at present, few gardens having been without covered arbours and shady seats; but of late they have been much neglected, and covered seats, or alcoves, are every where at this time preferred to them.

ARBUTUS, the Strawberry tree, a genus of plants ranged by Linnæus among the *decandria monogynia*, and of which there are four species; 1. Arbutus, with an erect stalk, smooth, sawed leaves, and many seeded berries, called the common Strawberry tree; 2. Arbutus, with trailing stalks, oval leaves, somewhat indented, flowers growing loosely, and many seeded berries; 3. Arbutus, with trailing stalks, and rough sawed leaves; 4. Arbutus, with trailing stalks and entire leaves, or berries. See the article *BERBERRY TREE*.

The common Strawberry tree is a shrub that retains its verdure all the year, and we have no other evergreen tree which endures the open air that so much conveys the pleasing idea of summer to us, in the midst of winter.

It is naturally a handsome spreading shrub, but may at the pleasure of the gardener, be raised into a middling tree; against this, reason, however, absolutely declares; it being one of those plants which bear a near inspection, and whose beauties are lost at a greater distance.

Those which have larger and more specious leaves and flowers, should be trained up to height; this should be kept to such a stature, that every eye may see for what it is respected.

The root spreads far, and sends its fibres deep beyond that superficial mould on which frost operates, and this is one reason of its perfecting its fruit at so dead a season, and retaining its leaves through winter. The natural

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thickness of its juices helps also to that purpose; and to their sluggish course, the consequence of that thick substance, is owing to the vast length of time required to ripen the fruit.

The bark of the trunk is a deep brown, that of the branches paler, and of the young twigs often purplish. The leaves are oblong, and of a form somewhat approaching to oval.

Their colour is a deep, but not unpleasant green; and their edges are in a most regular and elegant manner serrated; art never attained a comparable exactness or proportion.

The substance of them is firm and hard, and as they decay, frequently they acquire a scarlet colour, which is very pleasing.

The flowers are more considerable for their form, than size or colour; they are small, and of a greenish hue, naturally diversified a little with white, and sometimes tinged with purple. They are hollow, and as it were blown up, and indented at their rim. The fruit which follows these so slowly, is when ripe, of the bigness and form of the common Strawberry, but its seeds are within. Its taste to English palates, is austere and raw; but in Ireland, where the shrub is native, it attains a better maturity, and is sometimes eaten.

Culture of the ARBUTUS.

No great art is required to bring into the garden, or maintain in it a shrub which is a native of our own kingdom, and bears the bleak cold of our northern mountains unhurt, and in its full vigour.

The common way of propagating it is by layers; but it is far better to raise it by seeds. These should be taken carefully from the fruit when fully ripe, and laid to dry upon a papered shelf.

Let the gardener see that he chuses the ripest fruits for his seed, and let him take it from such only as grow upon a flourishing tree. When he has hardened it upon the shelf, let him dry and sift some common house sand, for preserving it during the winter. Let a small box be prepared, and sift over the bottom of it two inches more of the same sand set by the box, and let it stand by during the winter.

In the beginning of March sift away the sand, and the seeds will be in perfect good condition for growth.

Fill a couple of garden-pots with fine fresh mould, from under the turf in a good pasture, and upon the surface of this scatter the seeds, covering the mould in each pot with them, at about an inch distance.

Sift over them a quarter of an inch of fresh mould, and then give a very gentle sprinkling of water that has stood in the stove. This done, set the pots up to the rim in a bark-bed, of a moderate heat, and shade them.

The plants will appear in about eighteen days; but the exact time is not certain. From their first appearance they must be at times gently watered, and hardened by degrees to the air.

Let the gardener now consider how many he intends to raise, and selecting the strongest and the best looking among them for this purpose, let him pull up the rest in each pot.

This will give them more liberty; they will thrive visibly upon it, and the watering must be continued.

About the end of May they will be fit for transplanting into separate pots.

Let it be filled with earth from a dry pasture, and a little from under a wood-pile.

Let one plant be carefully set in each pot; and when the earth has been fixed about their roots, and drawn up a little about their slender stems, they must have another gentle watering, and be again set into the bark-bed. This will greatly promote their rooting.

They must be shaded till well fixed in the new pots, and every night gently watered; when they appear perfectly well recovered from the check of their removal, they must be hardened again, and used to the free air, by opening the glasses; and afterwards set out among the green-house plants.

At autumn they must be taken into shelter, with the rest,

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rest, and remain housed through the winter. This is the only time of their danger. While young, they are very subject to be damaged by frost; but afterwards they bear it perfectly well. Some of the extreme branches will perhaps be hurt afterwards, but very rarely the whole shrub.

When the young plants have been thus brought through their first winter, they will with less care stand all the rest.

In the middle of April let the gardener fix upon the spots where they are to stand; and in the evening of a warm showery day, let him open the holes for them.

He must throw down at the edge of each hole, some fresh earth from a pasture; and then loosening the whole ball of earth from the bottom and sides of the pot, let him take it out unbroken with the plant in it, and setting it upright in the hole, fill it up with the earth carefully, and give a moderate watering.

The *Arbutus* roots but slowly; but this way it will not feel the check, or need so much as shading.

The two succeeding winters, let these young trees be defended, from the severity of the frost; and from that time they may take their chance without danger.

ARCTOTIS, the name of a genus of plants which has no English name. Linnæus has ranged it among the *syngenesia polygamia*, and of which there are four species. 1. *Arctotis* with twenty radiating floscules, cut into three segments. 2. *Arctotis* with twelve radiating and almost intire floscules. 3. *Arctotis* with winged ferrated leaves, and oblong indented segments. 4. *Arctotis* with spear-shaped, narrow, indented, and intire leaves.

All these plants are natives of Ethiopia. The first and second are annual plants, and are propagated by seeds, which should be sown in March upon a moderate hot-bed. When the plants will bear it, they should be transplanted each into a single pot; and as soon as they are well rooted, they must by degrees be inured to the open air, in which they should be placed as soon as the weather will permit. They must be watered in dry weather, and transplanted into larger pots, before their roots fill the pots they are in.

The seeds may also be sown about the middle of April, upon a warm border of light earth, where the plants are designed to remain, they will grow stronger than those raised upon a hot-bed.

The third and fourth species may be raised from seeds, but the best method is by cuttings. These take root very freely and soon grow into handsome plants.

The gardener is to observe, that he does not let them make any shoots too low, for they will be troublesome to support; but for all the rest, he should suffer them to spread in their natural wildness; and it will be best to raise plants in this manner very frequently, to supply the place of the old ones, which are more subject to decay, and at best have less beauty; the leaves being fewer, and those as well as every other plant less lively.

About the latter end of May, let a border of rich mould be well dug and broke; and in this let the gardener plant as many handsome cuttings as he is desirous of raising.

Let them be taken from thriving, healthy plants, and set at eight inches distance.

When they are in the ground let them have a gentle watering, and let this be repeated every evening.

In the middle of the day let them be shaded by a mat, or a sloping reed-hedge; and let the ground be kept clear from weeds between them. By mid-summer they will be well rooted.

Let them be carefully taken up, and planted in separate pots of common garden mould.

Let these be placed in a shady part of the nursery, till they are well rooted in the pots, after which, let them be brought into the open part of the garden, where the hardy exotics are kept, and in the end of October, remove them into the green-house; here they are to be treated as the other plants, allowing them plenty of water at convenient times; and as much air as can safely be

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admitted into the place. They will thus flower with great profusion all the year.

ARCUATION, the term used for the raising of trees by layers. The first thing, in order to do this with success, is to chuse large and strong mother plants, which are usually called among the gardeners; stools. It is no matter whether the trees be crooked, or otherwise deformed; and the larger they are the better: they are to be cut down close to the ground. These are to be planted in a border six feet wide, and in a strait line six feet asunder: the border must be well trenched, or dug clear from all roots, clods, stones, or other obstructions. These trunks, or stools, being planted in this trench, will each throw out twenty, thirty, or forty plants, which may be begun to be laid about the Michaelmas following; and if the stools have been properly managed, they will also by this time have thrown out five, six or more main branches from the root; and on every one of these, as many side or collateral branches. These main branches must be bent down to the ground; and some gardeners cut them half through, that they may bend the more easily. When the main branches are thus laid all round the stool, then they must be pegged fast down; and after this the side ones and small ones may be served in the same manner; the main branches or shoots must be covered with earth all over, except the top; and the small side branches must be covered two or three inches thick upon the joints; and many give all the branches a twist, in order to make them take root the sooner. Some straw dung should now be laid over them, to keep them moist; and they must have a large basin of earth made round them, in order to hold the water during the ensuing summer. They must, if the weather is dry, be watered two or three times every week. About the middle of September following, they may be opened, to see if they have taken root; if not they must be let alone to the next spring, and by that time they will be fit to transplant into the nursery.

Elms, Limes, Poplars, Willows, *Platanus*'s, and many other trees, succeed very well by this operation.

ARISTA, the name of botanists for the beard or awn of corn, or that sharp pointed needle, that stands out from the husk or hofe of the grain.

ARTICHOKE, *Cynara*, a well known plant, of which there are two sorts cultivated in the kitchen gardens; one known by the name of the globe Artichoke, and the other by that of the French Artichoke. The former produces large round heads, with broad brown scales turning inward: the eatable part at the bottom is very thick and better flavoured than that of the other sort, which produces taller stalks, with less heads of a conical shape; the scales are narrower, and have less flesh at their bottom; on which account the French sort is pretty much excluded from the English gardens, the other being much preferable.

Both sorts are propagated from slips or suckers taken from the old roots in February, or the beginning of March.

In taking off these suckers, be careful to open the earth deep enough about each stock or root that you may readily get to slip the shoots off clean from the place whence they arise; minding to leave two good shoots, but never more than three, upon each root or stock closing the earth in again about the root, and also about the young plants, pressing it close about them with your hand.

The shoots thus slipped off, are proper for making a plantation, where wanted, without injuring the old bed.

These shoots should be planted in an open situation, and in good round; over which a considerable quantity of rotten dung should be spread in the autumn and dug in.

They must be planted in rows a yard and a half asunder, and not less than two feet, nor more than a yard distant from one another in the row. Give them some water immediately after they are planted, to settle the earth properly about the plants.

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The above plantation, if kept clear from weeds, and now and then watered in dry weather, in the beginning of the summer, will not fail to yield good Artichokes the following autumn.

A plantation of Artichokes will continue to produce good heads five or six years, and sometimes longer; but it must be observed, that such persons as desire to have a succession of this fruit for four or five months in the summer, should make a new plantation every spring, for the old stocks which have been planted a year or two, produce heads in June or July, and those planted now produce heads in August, September, and October.

In the month of July the Artichokes on the old beds will come into use; and the plants must be managed in the following manner.

But it will be proper previously to observe, that if you desire to have large Artichokes, you must, in order to encourage the main head, cut off all the suckers or small shoots, which are produced from the sides of the stems; and these in some families are dressed for the table.

It is also necessary to observe, that as soon as the Artichoke, that is, the principal head, is cut, to let the stem be immediately broken down close to the ground. This practice is, by many people, utterly disregarded, but it should not: for the stem, if permitted to remain, will greatly impoverish the roots, and injure them much more than is generally imagined.

In the month of August let the Artichokes, which were planted last March be examined. Many of these plants will now be in fruit; and besides the principal, or top fruit, many small heads or suckers will be shot up from the sides of the stems; but in order to encourage the principal head to grow to a large size, all these side shoots should be displaced, as we already observed, with regard to the Artichokes on the old beds.

This is constantly practised by persons, who prefer one large head to three or four small ones; but when you practise this, the suckers should always be taken off, before they exceed the size of an egg.

The gardeners about London gather these as above; they tie them in bunches, and carry them to market, where they have a ready call for them.

About the middle, or towards the latter end of November, it will be time to cut down the leaves of the Artichokes, and earth up the plants to protect them from the severe frosts.

The leaves must be cut down close to the ground.

This being done, you may practise either of the following methods in earthing, or as it is called by gardeners, in landing up the plants. The first is this: let trenches about twenty inches wide be marked out between all the rows, and let the said trenches be dug out a good spade deep, and lay the earth as you dig it out, over the rows of plants, observing to cover the crowns of them, at least six or eight inches thick.

But in landing up the plants, some gardeners, instead of digging out trenches as above, practise the following method.

They set the line exactly along the middle of each of the spaces, between the rows of plants, and with their spade cut a mark according to the line: by this they form, as it were, beds four feet and a half, or five feet broad, with one row of plants, standing along the middle of every such bed; the ground is then dug regularly, bed by bed, digging close about, and between all the plants, at the same time working or rearing the earth gradually from the above lines, or marks on each side the row of plants, into a ridge; the ridge is made sloping on each side.

These are the only methods to be taken to protect Artichokes from frost; some indeed never land them up, but instead of that, lay some long dung over the plants, but this is not so good for protecting the plants, for it will not keep out the frost so well as a good ridge of earth.

But notwithstanding this precaution, if the winter should prove uncommonly severe, it will also be proper to lay over every ridge a covering of straw, or other dry long litter; and this, together with the ridge of earth, will effectually secure the Artichokes.

In dressing the Artichokes there is one thing proper to be observed, and that is, when any of the strong plants now shew fruit, and you desire to save that fruit, they should not be cut down: but let the leaves be tied up close with a hay-band, and then lay the earth over the roots as above, and up close about the outsides of the leaves, which will preserve the plant in a growing state, and will bring the fruit to perfection.

In the beginning of March, where the ground was trenched up, and laid over these plants, to protect them from frost, it must now be levelled, and dug about the plants; as you proceed, observe to let two or three of the strongest shoots remain.

The Artichoke delights in a deep, rich, and moist soil, well prepared with rotten dung, and mixed to the depth of three feet at least: for the deeper the mould is, the less watering they will require in summer, and produce larger and better flavoured heads.

The kitchen gardeners near London, who endeavour to make the most of every inch of their high-rated land, generally plant their rows of Artichokes nine or ten feet asunder, and besides sowing between them Radishes, or Spinach, they plant two rows of Cauliflowers, at the distance of two feet and a half asunder, in rows, and four feet from row to row, so that full five feet are allowed for the Artichokes. In May, when the crop of Radishes, or Spinach, is off, they sow along the middle of the space, between the two rows of Cauliflowers, a line of Cucumbers for pickling, at the distance of three feet; and between the Cauliflowers and Artichokes, they plant for winter use a row of Cabbages, or Savoy, which have room enough to grow, after the Cauliflowers and Artichokes are taken off: thus the ground is fully cropped, during the whole season. A moist, rich soil, is always best for Artichokes: but if it be too moist, the roots will not live through the winter: such ground should, therefore, be allotted for fresh plantations, made every spring, to supply the table in autumn, after the old stocks have done bearing; but for early fruit, the plants should be in a drier situation; they should be also in an open place, that is free from the drip of trees, for they would draw the plants up weak, and thereby render the fruit small and trifling. If the Artichoke stocks shoot forth but weakly in the spring, as they will do if they have been hurt by frost, or too much wet, it is best to uncover them with a spade, loosening, and beaking the mould around them, or rather to dig the whole ground, if it be not planted with any thing else, and then to earth and raise a small hill about each stock, which will greatly help them: in about three weeks or a month after, the slips will be fit to take off.

Jerusalem ARTICHOKE, a species of the *Helianthus*, or Sun-flower, propagated in many gardens for the sake of the roots, which are esteemed by many people.

They are propagated by planting the smaller roots, or the larger ones cut into pieces, observing to preserve a bud to each separate piece, either in the spring or autumn, allowing them a good distance, for their roots will greatly multiply; the autumn following, when their stems decay, their roots may be taken up for use.

These should be planted in some remote corner of the garden, for they are very unsightly while growing, and their roots over-run whatever grows near them, nor can they be easily destroyed, when once fixed in a garden.

ARUM, Wake-robin, or Cuckow-pint, a genus of plants, ranged by Linnæus among the *gynandria polyandria*, and of which there are eighteen species, one of which is the common Dragon. See the article DRAGON.

One of these species, called Trifoliate Arum, or Arum with three leaves growing at a joint, is a very curious plant, and therefore merits a more particular account in this work, especially as it is not so frequently found in our gardens, as it deserves.

We are accustomed to a plant of this kind under our hedges, which if less common, would not be seen without wonder: for nature scarce affords a more singular genus. But with all the peculiarity of the

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common kind, this, which is only to be found where curious industry has placed it, has great beauty.

The Trifoliate Arum is a native of America, and was brought into England, with some of the first plants imported from that quarter of the world.

The root is roundish, soft, of the bigness of a filberd, and covered with a pale brown skin; from its top spread many fibres.

The whole plant consists of two leaves, rarely more, and its flower, which all rise together from the head of the root, enveloped with a thick film; and before that opens to let the foot-stalk of the leaves spread, the whole forms a round stem. The membrane is whitish towards the ground, greener upwards, and spotted with a wild irregularity, with red.

The leaves have long foot-stalks, and these, with their hollow filmy bottoms, are also of a pale green, spotted with crimson.

Each leaf is composed of three parts oblong, broad, waved, and pointed. The colour is a greyish green; but the veins, which are extremely conspicuous, are red.

Between the foot-stalks of the leaves rises that of the flower, spotted as the rest, but less so.

The scabbard is extremely beautiful in this plant; it is very large, open, and irregular at the tops and edges. Its ground colour on the outside is a fine strong green, and on the inside purple, striped throughout with broad upright bands of white; in this, as seated in a canopy, appears the club or spadix: it is oblong, thick, rounded, obtuse at the end, and varies in colour from pale green to white, and to the most bloody purple.

This is all that is seen till the scabbard is torn open, then appear the parts of fructification. Two rows of glands are seen on the midst of this part of the club, they are thick at the base, and terminate in hairy extremities; and between these are situated a number of buttons, but without filaments, adhering to the body of the spadix; they are large and square.

Round the base of the spadix, stand numerous oval bodies, tipped with hairy filaments: the first named bodies were Nectaria, but these are the rudiments of fruit; these feathered tops are of the stigmata, and they have no style. Each is followed by a roundish berry, in which are many seeds.

Culture of the Trifoliate ARUM.

We have already observed that it is a native of America, and shall now add that it is found in various degrees of heat and cold, but always in the same soil: this is a mellow earth, enriched by fallen leaves and rotted boughs of trees, whose shade in some degree covers it. Thus we are to raise it, and it will attain all its natural perfection.

A compost should therefore be made in the following manner: mix equal parts of light pasture mould, pond-mud, and earth of an old wood pile; throw them in a heap, and let them lie some months.

Let seeds be saved in America and sent over; and in the latter end of February, let a couple of pots be filled with the compost: let the seeds be scattered over the surface, and covered with a quarter of an inch of the same mould, sifted over them. Let these be plunged up to the rim in a bark-bed, and the earth kept moist.

When the young plants appear, let the weakest, where they stand too close, be taken up; and when the others are of a size to remove, let each be planted in a small pot of the same compost.

Let them be shaded till they have taken root, and then inured to the air by degrees. In June let them be taken intirely out, and a fortnight after planted in a warm border, where there is some shade, the holes being filled with the compost.

Here they will stand our winters; and after the first stock is thus raised, they may be encreased by parting the roots, which should be taken up for that purpose in autumn.

ASARABACCA, *Afarum*, the name of a genus of plants, ranged by Linnæus under the *dodecandria monogynia*, and of which there are four species; 1. *Afarum*,

with kidney-shaped leaves, which have two blunt points, or the common *Afarabacca*; 2. *Afarum*, with kidney-shaped leaves, ending in a point; 3. *Afarum*, with blunt, heart-shaped, smooth leaves, with foot-stalks; 4. *Afarum*, with sessile imbricated leaves, and flowers cut into four parts, or the *Hypocist*.

These are perennial plants; the first grows naturally in some parts of England, and other countries of Europe: it is propagated by parting of the roots in autumn, and thrives in a moist, shady place. The second species is a native of Canada, and is propagated like the first. The third sort grows naturally in Virginia, Maryland, and Carolina: it should be planted in a shady border. The fourth is a native of Spain and Portugal, and is tenderer than any of the rest; they are propagated like the first and second sorts, by parting of the roots.

ASCLEPIAS, Swallow-wort, a genus of plants, ranged by Linnæus among the *pentandria monogynia*, and of which there are eighteen species. But the description and culture of the three following which are the most beautiful plants of this genus, will enable the gardener to cultivate the rest, whenever they shall be desired.

Variegated Flowered ASCLEPIAS.

This is a plant of extreme elegance, known in very early times, and afterwards left unobserved for many ages, a native of the Indies, and of our American possessions: its beauty is sufficient to ensure it in this age of curiosity, from farther neglect.

Linnæus calls it *Asclepias*, with oval, rugged, naked leaves, a simple stalk, and low umbells, with woolly foot-stalks. The name is long, but it conveys a description of the plant.

The root is thick, and of an irregular shape; the stalk is firm, upright, purplish at the base, and of a pale green upwards, and is a little downy.

The leaves stand in pairs, and they are of a simple, pleasing form, oblong, considerably broad, supported by short, reddish foot-stalks, and in themselves of a deep coarse green, with a red middle rib.

They are not downy, as the stalk is, but rough upon the surface, from their own natural inequalities.

The flowers are not large of themselves, but they cloathe the top in a vast tuft, conspicuous at a distance by its bright colour, and much more near from its elegant variegations.

The outer-part of each flower is sometimes white, but when the plant is in its highest perfection, it is lightly stained with a flesh-colour; the inner part is of a glowing crimson, somewhat tinged with a cast of purple.

Each flower stands in a little cup, formed of a single piece, broke into five pointed segments at the edge, which remains with the fruit.

The body of the flower is formed of a single petal, cut into five deep segments, which are of an oval form, pointed at the end, and somewhat bent.

Within these stand in each flower five nectaria, surrounding the parts of impregnation; each of these is broad, short, and of an irregular figure, and from its base rise a kind of horn, whose points turn towards the filaments: within this, round about the filaments, is placed another singular substance, of a truncated form, surrounded by five scales, in the manner of a case at the sides, and opening by as many cracks.

Within these stand five filaments, so short, they would not be distinguishable, but for the buttons they support; and in the midst of them rises a double germen, or rudiment of a fruit, with two styles, so short, that like the filaments, they would not be distinguishable, but for the tops or stigmata they support.

The fruit succeeding these, is a double pod with numerous seeds in each, crowned with down, and a loose receptacle.

Culture of this ASCLEPIAS.

The plant is a native of North America, and may therefore may be raised with us easily, and kept alive with little trouble; but though the cold of its natural climate makes it bear ours well, we have not the heat: our summers do not equal theirs.

Therefore to make the plant flower in all its glory, we must give it the assistance of the stove.

The soil in which it is naturally found, is a loose, light, rich mould, such as is common on the edges of forests, where broken boughs and decayed leaves have rotted upon it, and covered it from year to year, rendering it at once rich and mellow.

This must be imitated by the following compost: mix a barrow of good earth from under the turf in a meadow, half a barrow of pond mud, and a barrow of rich earth from under an old wood-pile; let these be well stirred together, and thrown in a heap till wanted.

Let some of the seeds be procured from North America, and directions given that they may be gathered when full ripe, and sent over in the pods.

In the beginning of March, sow these upon a moderate hot-bed, and when the plants appear, forward them by frequent gentle waterings.

When you can see which are the strongest plants, pull up the others, reserving only so many as you chuse to raise.

Let them stand in this bed till they crowd one another, then take them up carefully with a little of their own earth, and plant them severally in small pots, filled with the compost.

Give them a gentle watering, set them in a bark-bed, and shade them till they are well rooted.

Then by degrees harden them to the air, and bring them out in July among the green-house plants.

For this year they are only to be set in the green-house in winter, and taken out with the rest in spring; but the succeeding autumn let one or more of the finest of them be taken into the stove, and they will then flower with the full beauty they have in their natural climate.

Giant ASCLEPIAS.

This is a plant long known to the botanical students, and as long celebrated for its singularity and beauty.

Linnaeus, to distinguish the species, names it *Asclepias*, with oblong oval leaves, embracing the stalk. The common name by which our gardeners know it, is *Beidal-offar*.

The root spreads under the surface, and has innumerable fibres; the stalk is firm, tough, upright, and seven feet high, its substance woody, and its colour brown toward the bottom, and upwards purplish, tinged with green; the leaves are large: their shape is oblong, with a tendency to oval, and they have an obtuse point; two stand at each joint, and having no foot-stalks, their broad bases close about the stalk; their colour is a fine green on the upper side, and paler underneath; and their ribs, which are very high and conspicuous, are naturally of a whitish green, but often tinged with purple.

The flowers spread from the extremity of the stalks into a kind of umbells, and are extremely singular and elegant; they are of a pale red towards the ends of the petals, and whitish, with a tinge of green at their base, but in the middle of the flower the colour is a very lively red.

This variation in the colour of every flower, their elegance single, and the full beauty of the regular cluster of them, stamp upon the plant a character of grandeur, none should neglect, who are at the expence of raising exotics.

After each flower come two pods, large, swollen, and of a lively green, tinged variously with purple: but from the largest cluster of flowers few of these are produced, for the generality are abortive.

This is the general figure of the plant, but its flowers demand a more strict attention, for few are more singular.

Each flower has its separate cup; this is very small, formed of a single piece, and nicked in five parts at the rim.

The body of the flower is formed of a single petal, divided deeply into five segments: these are large, and of an oval form, but pointed at the tip, and they naturally bend a little: these have the light red tinge we mentioned; in the outer part of the flower, and the united

part at the bottom, it is whitish and greenish.

In the midst of the flower stand five nectaria, or glands, with a kind of solid plates or scales, rising from them: these converge, and they are of the fine high and gaudy red, which we have described, in the central part of the flower; these solid plates, arising from the glands, are altogether singular.

The glands themselves are found in the flowers of all the *Asclepias* kind: but in others they are auriculated outward, and have a sort of horn, turning its point inward. The plates in this flower give it an aspect unlike, not only to the others of its kind, but to every thing in nature.

In the centre stand five filaments, so short, that they would not be perceived but for their buttons, which are large and oblong: these are fixed to a short truncated body, splitting at the sides in five parts.

The styles are two, and they, like the filaments, are so short, that but for their stigmata, or tops, they would scarce be distinguishable.

Culture of this ASCLEPIAS.

It is a native of the east, and of the warmest parts of South America, and with us requires the heat of a stove to bring it to any degree of perfection.

The method of propagating it is by seeds, and great care should be taken to obtain these in their pods, for otherwise they usually fail.

Early in the spring let a couple of garden-pots be filled with some light, rich earth, from an improved part of the garden: and upon the surface of this scatter the seeds at equal distances; sift over them about half a quarter of an inch of the same mould, and then set the pots up to their rim in a bark hot-bed.

Once in three days give them a gentle watering, with water that has stood in the stove twelve hours: and every now and then open the glasses for a little time, to give them air.

Thus they will shoot, and sooner or later, according to the newness or age of the seeds, the gardener will see his young plants.

These he must watch carefully, once in two days giving them a very gentle watering: and when the sun is hottest upon the place, allowing them a little air.

When they have thus arrived at some little height, let there be as many small pots provided as there are plants, let these be filled with good garden mould, and set in the bed for three days, that the earth may be of the same degree of heat with that in which they are growing.

Then let them be carefully taken up, and one planted in the middle of each of these pots.

When fixed in the mould, let them have a gentle watering, with water which has stood to be warmed in the stove, and let them be all set up to the rim in the bark: let the glasses be shaded with mats, and little air admitted till they have taken root.

After this they will grow fast: let them, when they are increased in size, be shifted into larger pots; and when they are so tall as to reach the glasses of the frame, let them be taken into the stove, and set in the bark-bed there.

After this they will require nothing but the common management of stove-plants, and they will rise to their full perfection, and produce their singular and elegant flowers in great abundance.

Willow-leaved shrub ASCLEPIAS.

This elegant and singular *Asclepias* is very well worth the attention of all who propagate curious plants. It is of regular growth, and pleasing aspect, and not only of considerable duration in the time of flowering, but full of singularity in the fruit.

Linnaeus calls it, shrubby *Asclepias*, with the leaves lanceolate, and turned at the edges. The root is spreading, and hung with many long fibres.

The stem is woody, and covered with a brown bark. The branches are numerous, and the young shoots are green, tinged often in part with red. The leaves on the lower part of the branches stand in pairs, but toward the top less regularly: they are long, narrow, and of a faint

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faint green, curled frequently at the edges, and marked with reddish ribs.

The flowers rise from the bottom of the leaves in small umbells, six or eight in each. These have a long common footstalk, and from the head of that as many separate shorter footstalks as there are flowers. These spread out, and form the open rounded head; and the whole umbell naturally hangs or droops a little. The colour of the flowers is a pale whitish green in the petals, and a duskier tinge with somewhat of yellow or hoary in the middle.

Each is composed of five segments of a petal, and a conspicuous nectarium, and is placed in a cup formed of one piece, cut into five slight parts.

The cup is small in comparison of the flowers, and is permanent.

The five segments of the flower resemble so many petals: they are of an oval figure but pointed, and lightly turned with the sun.

The nectaria are equal in number to the segments of the flower, and they surround the parts of impregnation. Each is of a figure approaching to oval, but auticulated on the outside; and from the base rises a kind of small horn, which bends towards the parts of impregnation.

Beside this there is a truncated body, which covers the organs of impregnation, with five scales at the edge, and as many openings at the sides; this is an appendage of the nectarium.

The buttons are five, they have scarce any filaments, and they are buried, as it were by the truncated body of the nectarium among the scales.

There are two rudiments of fruit to each flower; they have scarce any styles, but are crowned with simple stigmata, and are at length ripened into two large, oblong, inflated pods, containing numerous seeds winged with down, and a loose receptacle.

Culture of this ASCLEPIAS.

It is a native of the warmer parts of Africa where it lives freely in a dry sandy soil, exposed to the full sun; but though it bears this heat and barrenness, it is not the soil or exposure most suited to its thriving. When it happens to fall into the side of a thicket, where there is shelter, and a better mould, it shews more vigour and more beauty. According to these differences it will produce flowers of a deeper or paler colour in great variety; and we see some considerable change in that respect, but it is the state wherein we have represented them they are most elegant.

The gardener has his choice of raising it from seed, or by cuttings; but there is no advantage in the raising it from seed, which is the more tedious way; and the cuttings take root so easily, that it is better to depend on them.

The best season for planting these cuttings is June, and they should have the advantage of a hot-bed. In this let them be kept till they have taken good root; and then let them be taken up, and planted separately in pots, of the light compost.

They should then be set in the hot-bed again, and shaded from the noon-day sun. They should be watered every evening; and when they are well established, they should be more perfectly hardened by keeping open the glasses, and then brought out among the green-house plants.

They must early in autumn be taken into the house, and removed into larger pots, as they increase in size; always preserving the whole ball of earth from the former pot about them, and trimming the fibres that hang from its edges.

They will thus grow to six or eight feet high, and flower as well as in their native country.

ASH-TREE, *Fraxinus*, a genus of plants ranged by Linnæus under the *polygamia diaecia*, and of which there are three species. 1. Ash-tree, with the smaller leaves sawed, and flowers without petals, or the common Ash-tree. 2. Ash-tree, with the smaller leaves sawed, and flowers having petals. 3. Ash-tree, with the smaller leaves very entire and taper footstalks.

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The first is a native of most parts of Europe particularly of England, and in some gardens is preserved a variety of it with variegated leaves. The second sort grows naturally in the southern parts of Europe, and the third in Virginia. These trees are propagated by sowing the seeds as soon as they are ripe. The ground where they are sown should be kept clean all the summer, and not disturbed: when the plants come up they must be kept clean from weeds, and if they make good progress in the seed-bed, they will be fit for transplanting in autumn, as soon as their leaves begin to fall; and to prevent injuring their roots they should be taken up with a spade, placing them at a foot and a half distance, in rows three feet asunder. Here they may remain two years, at the end of which time they will be strong enough for planting in the places where they are to remain. The ground where the plants are raised should not be better than that they are designed to stand in; and it is much the best method to make the nursery upon a part of the same land where the trees are designed to be planted, and then a sufficient number of the trees may be left standing upon the ground. This tree propagates itself in plenty by the seeds which scatter in autumn, provided they happen to fall in places where cattle do not come.

Mountain ASH. See the article SERVICE-TREE.

ASHES. The ashes of all kinds of fuel make a fine manure for lands: they are the most proper for cold and wet lands, and should be kept dry till the time of using them, that the rain may not wash out their salts; one load of dry ashes are found by the farmers to go as far as two loads that have been more carelessly kept; the wetting them moderately sometimes with urine, or soap-suds, adds to their virtue; six loads of common ashes are generally allowed to an acre, but two loads of those, preserved in this manner, will be sufficient for the same quantity of ground.

The advantage that vegetable ashes are of to land, is abundantly seen in the profit of the farmer, by burning his stubble, &c. but sea-coal ashes are the best for cold lands, and their virtue is found to be the most lasting of that of any kind. Ashes are a great improvement to grass ground, as well as ploughed lands. On the former they are to be strewed in April, and on the latter as soon as the corn is sown.

Soap-ashes, after the soap-boilers have done with them, are found to be of great advantage to cold and sour lands. The worst sort of land we have, which is naturally over-run with furze and heath, has been tried with this manure, in large quantities, and vast crops of wheat have been obtained from it for six years together. Kiln-ashes, such as are made of straw, furze, &c. are as good as any, but they are much lighter.

The maltsters in the west of England sift these over their corn and grass; but being very light, this must by no means be done in windy weather, and succeeds best when done just before rain or snow.

Pot-ashes, after the pot-ash-men have done with them, are also of great service; but as they have been, in a great measure, deprived of their salt, they are to be laid on in considerable quantities. Turf ashes are very good for all sorts of land, but especially for clay land; but these are much better when mixed first with lime.

ASPARAGUS, a well known genus of plants, generally called Sparagus, and by corruption Sparrowgrass. It is ranged by Linnæus among the *hexandria monogynia*; and of which there are ten species; but the only one cultivated in the gardens is Asparagus with an upright herbaceous stalk, bristly leaves, and an equal stiffula, or the garden Asparagus. The other species are kept only in the gardens of the curious for the sake of variety, and need not therefore be described here.

The proper season for making new plantations of Asparagus, is in March, that being the proper season to remove these plants: but it may be done any time in the month, when the weather is mild.

In making plantations of these plants, one great article to be considered is, to make choice of a proper soil: it must not be wet, nor too strong and stubborn, but

but such as is moderately light and moist, so as readily to fall to pieces in digging or raking, &c. and in a situation that enjoys the full sun.

The ground where you intend to make new Asparagus-beds, should be regularly trenched, and a large quantity of good rotten dung, buried equally in the bottom of each trench. The trenches should be deep enough to admit of the dung's being buried at least twelve or fifteen inches below the surface of the ground.

The ground being dug, and laid level, divide it into beds four feet wide, with alleys two feet wide between each bed.

Four rows of roots to be planted in each bed, and ten or twelve inches distance to be allowed between each plant, observing the two outside rows of each bed should be six inches from the edge.

Next let it be observed, that the plants for this plantation must not be more than two years, and are preferable, if only one year, old. The seed for raising these plants, may be sown any time in March, on a bed of rich earth; and when the plants are of a proper height, they must be planted out in the following manner.

Stretch your line lengthways on the bed, six inches from the edge, and with a hoe, or spade, cut a trench close to the line, about six inches deep, making that side next the line nearly upright; when one trench is opened plant that, before you open another, placing the plants at the distance above directed.

Great care must be taken in setting the plants, that they do not lie flat in the bottom of the trench, or drill, they should be placed nearly upright, against the back of it, so that the crown of the plants may also stand upright: let them be placed between two and three feet below the surface of the ground, as near as possible, in an equal depth, spreading the roots somewhat regular against the back of the trench, at the same time drawing a little earth against them with the hand, just to fix the plant in its due position. When one drill is thus planted, immediately with a rake draw the earth into the trench, over the plants, then proceed to open, plant, and cover another drill, as above, and so on till the whole is completed. When they are all planted, let the surface of the beds be raked smooth, and cleared from stones.

At each corner of the beds let a firm stake be driven into the ground, as a mark for the alleys.

The Asparagus being planted, the next care is, when the plants come up, which will be about the end of the next month, to keep them clean from weeds, which must be well attended to during the summer season.

It will be three years from the time of planting, before the Asparagus-plants produce buds large enough to cut for use.

A plantation of Asparagus, if the beds are properly dressed every year in the spring and autumn months, will continue to produce good buds ten or twelve years.

It is a custom sometimes practised, in making new plantations of Asparagus, and not a bad one, to sow the seeds at once, in the beds where the plants are to remain: by this means they are not disturbed by removal, and, consequently, cannot fail of producing a regular crop.

But it should be observed, that if two pieces of ground were laid down the same year in Asparagus, one planted with young plants, the other sown as above, with seed, that piece which was planted will be ready to cut a year before that which was sown.

However, to such as choose to raise a plantation of Asparagus at once from the seed, as above, the method is this: the beds should be four feet wide, and prepared as before directed for the plants, then mark out four or five lines lengthways the beds, along these lines, at the distance of every nine or ten inches, put in a few seeds, covering them half an inch deep.

When the plants have been come up some time, they must be thinned, leaving only two or three of the strongest in each place: and after a while thinned again, leaving but one of the best plants in each hole.

A plantation thus raised, will produce buds fit to cut

the fourth spring after sowing, and the fifth year, will be very fine and large.

Asparagus may also be raised from seed, in the following manner: sow the seed broad-cast, all over the bed, then tread it in, and cast some of the earth out of the alleys, evenly over the bed, and rake it smooth. The plants will come up in a month or six weeks, when they must be kept very clean from weeds, by a careful hand, weeding it different times in the summer. If the weather is very dry when the plants first come up, it will be proper to refresh them now and then with water, which will greatly forward them in their growth.

They will be fit to plant out for good the following spring.

In March the Asparagus-beds must be dressed for the spring: this is done by forking, or slightly digging them with a three-pronged fork: you should, therefore, be provided with a proper fork, which should have three tynes, about nine inches long, the tynes should be perfectly flat, about an inch broad, pretty thin, and the ends of them round and blunt. In forking the beds, be careful to loosen every part to a small depth, taking great care not to go too deep, lest you wound the crowns of the roots.

The above work of forking the beds, is necessary to be done every spring, not only to loosen the ground to give liberty to the buds to shoot up, but also to give free access to the sun, air, and showers of rain; the beds being forked, they must afterwards be raked even, observing, that if you do not rake them immediately after they are forked, to defer it no longer than till the end of March, at farthest till the first week in April: by that time the buds will begin to advance towards the surface.

As the method of cutting Asparagus may not be familiar to every one, it will be proper to explain it.

Provide yourself with a knife, the blade of which must be eight or nine inches long, about an inch and a half broad at the haft, and not more than half an inch at the point, which should be rounded off from the back, and made somewhat blunt, and the edge should be made full of small teeth, like a saw; when the buds are three or four inches high, they are fit to cut: slip the knife down close to the bud, and take it off three or four inches within the ground; be careful not to wound or break off any young bud coming up from the same root, for there are always several buds in different stages of growth, advancing at the same time from the same root.

After the twentieth or twenty-fourth of June, you must desist from cutting, otherwise it will greatly weaken the roots: for so long as you continue to cut the buds, the roots continue to send up new shoots, but every time they will be smaller: and the roots would so greatly exhaust themselves, as not to be capable of producing any but very small buds next year.

Before the Asparagus runs up to stalks, the beds should be thoroughly cleared from weeds, a work which cannot be so readily done after the stalks are run up to a great height.

Particular care should also be taken to keep the young Asparagus-bed perfectly clear from weeds.

The young plants, which were sown in the spring, will be up in June, and should likewise be carefully hand-weeded:

In the beginning, or some time in October, cut down the Asparagus stalks, and dress the beds.

Let the stalks, or haulm, be cut down close to, or at least within two or three inches of the surface of the beds: carry them immediately off the ground, then with a sharp hoe, cut up all the weeds, and draw them off the beds into the alleys.

This done stretch the line, and with a spade mark out the alleys between eighteen and twenty inches, or two feet wide, according to the width they were at first made.

Then dig the alleys one spade deep, and spread the earth, at least the greatest part of it, neatly over the beds: and as you advance in digging, mind to pare the weeds,

weeds, which were raked off the beds into the bottom of the trench, and cover them a proper depth with earth; observe to dig these alleys in a neat manner, that is, let an equal quantity of earth be laid over every bed, and make the edges of the beds full and straight; the alleys should all be of an equal depth, and the bottoms should be level.

Where it is intended to manure asparagus beds with dung, it should be done in October, but the dung must be applied before the alleys are dug.

The dung for that purpose must be very rotten, and also very good: none is more proper than the dung of old Cucumber, or Melon beds; when the haulm and weeds are cleared off, this must be spread over the beds; let the dung be well broken, and laid of an equal thickness in every part: then dig the alleys as above directed, and spread a due quantity of the earth of each alley over the dung.

At the same time the Asparagus, which is intended for forcing, should have their stalks cut down, and the weeds drawn off the beds into the alleys, as above directed: then dig the alleys to bury the weeds, and as you proceed, spread a little of the earth over the beds.

But that which is to be forced the ensuing winter need have nothing more done than to cut down the haulm, or stalks of the plants.

The Seedling Asparagus, which was sown in the spring, should, likewise, now have a little dressing.

That is, clear the bed from weeds, and then spread an inch or two in depth of rotten dung over the bed.

This should not be deferred longer than the beginning of November, and the following method is to be observed: cut down the stems, or haulm of the Asparagus, close to the surface of the beds, and let this be directly carried away.

Then with a sharp hoe let every weed on the beds be cut up, and at the same time draw them all off into the alleys.

Then set the line, and with a spade cut, or mark out, the alleys, about eighteen or twenty inches wide: this done, let the alleys be dug out one moderate spade deep, and lay the earth neatly over the beds, and as you go on let the weeds which were drawn off the bed be buried in the alleys a proper depth, and let the edge of every bed be made full and strait.

Hot-beds for raising early ASPARAGUS must be made in the following manner: get some good dung for that purpose, and shake it up in a heap, and in eight or ten days after it will be fit for making the bed.

Make the bed a yard, or three feet and a half high: let the top be made level and smooth, then lay on the earth, observing to let it be six or seven inches thick in every part, making the surface even: but the frame is not yet to be put on, for the warmth of the bed being at first very strong, it might occasion it to heat too violently.

The bed being thus prepared, begin and place the roots on the surface, first raising a ridge of earth five or six inches high, at one end, to place the first course of roots against, then place them one against another, as close as can be, till you have filled the bed, observing not to lay the roots to the full extent of the bed, but a clear space of at least two inches on each side, to receive a wall of earth against the outside root.

The whole being planted, get some pretty moist earth, and let this be banked up close against the outside roots, arising an inch or two above their crowns: this done, cover the crowns of the roots all over with light earth, about two inches thick, which concludes the work, till the buds begin to appear through the surface.

When the buds appear through the earth, lay on three inches depth of more earth, and by this time there will be five inches of earth over the tops of the roots, then bank up a little more moist earth against the outsides, as above directed; this being done, prepare to put on the frame and lights.

Before you put on the frame, let a quantity of sharp pointed stakes, about two feet long, be procured, and also some thick bands, or ropes of straw or hay; these

hay or straw-bands, are, by means of the stake, to be fixed and carried quite round the top of the bed, from the surface of the dung to that of the earth, and are for the frame to rest on, to secure the earth which was banked up against the outside roots, fixing the bands properly with the above stakes, thrusting them down at due distances into the bed, as far as the top of the stakes, to be level with the surface of the earth: this done, set on the frame, resting it upon the band of the straw, and put on the glasses.

The upper part of the straw, or hay, must be level with the surface of the earth.

The roots used for this purpose should be three years old, and never more than four; a frame will contain, in each light, three or four hundred roots, and upwards, if properly placed.

Let it be observed, that during the time the bed is without the frame, if there should happen to fall much rain or snow, to cover it all over with a good thickness of straw, or mats; or otherwise, to put on the frame and lights.

It must be remarked that for the first week or ten days after the bed is made, and the roots are planted, that the state of its warmth should be every day carefully examined: for that purpose thrust two long sticks down betwixt the roots, into the dung, in different parts of the bed, when upon drawing up the sticks two or three times a day, and feeling the lower parts, you can readily judge of the degree of heat; when it is found to be so violent as to threaten to burn the earth, and scorch the roots, it will be adviseable to pour a large quantity of water all over the top of the bed, sufficient to penetrate considerably down into the dung; and it will be likewise proper to bore, with a long thick stake, several wide holes in the dung, on each side of the bed, to let in the air, and to let the rank steam and burning quality of the dung pass off more freely; but when the heat is become moderate, the holes must be closed again.

Likewise observe when the heat is moderate, it will be very proper to lay a quantity of dry, long litter, round the side of the bed, which will preserve a fine kindly-growing heat, and will defend the bed from being chilled by heavy rains, snow, &c.

In the next place, observe when the heat of the bed begins to decline, or fall off, you should prepare to renew it as soon as possible, which is to be done by applying a lining of hot dung to the sides of it.

When there happens, at any time after the frame is on, to be much steam in the bed, the lights should be now and then raised about an inch, to let it pass freely away.

Continue to cover the glasses every night, and in bad weather with mats or straw.

The bed, if made and managed as above directed, will begin to produce Asparagus very thick, in four or five weeks; and provided the heat be kept up, will continue producing buds in great plenty, for about three weeks. A bed for a three-light frame, will for that time produce three or four hundred buds a week.

The method of gathering Asparagus in hot-beds, is to thrust your finger down gently into the earth, and break the bud off close to the roots, which they will readily do; but the cutting them with a knife, as practised in the natural ground, would by reason of the buds coming up so very thick, one under another, destroy as many, or more than you gather.

When it is intended to have a constant supply of Asparagus in the winter and spring seasons, till that in the natural ground comes in, you should make a new hot-bed every three weeks.

A quantity of fresh plants must also be procured for every new bed: for those which have been once forced in a hot-bed, are not fit for any use afterwards, either in a hot-bed, or natural ground.

Those persons who constantly would raise plants for forcing should sow some seed every year, observing that when the plants are one year old, to transplant them into an open spot, in rows, nine inches asunder, and about the same distance

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distance in the row; when they have two summers growth, they are then fit to be taken up for forcing: but if they stand three years before you take them up, they will produce much larger buds.

It is necessary to have three different pieces of ground always employed at the same time with Asparagus-plants, for the above purpose, that is, one piece for the seed-bed, with seedling plants, which should never stand longer than a year before transplanted; the other two pieces to be with transplanted plants: one to be a years growth from the time of planting before the other, by which method of sowing a quantity of seed, and planting a quantity of plants every spring, you will, after the first three years, obtain a fresh piece of plants every year, fit for forcing.

The season to sow the seed is the last week in February, or the first fortnight in March: it should be sown in a spot of light, rich ground; sow it tolerably thick, and tread it in, and spread some earth on the alley over it, and then rake the surface of the bed smooth.

This is the proper management of a hot-bed, for raising or forcing early Asparagus: and if this method is followed, the bed will soon begin to produce abundantly; the plants will rise very thick in about a month or five weeks, and be of surprising quick growth.

The next thing to be observed, is that when the heat of the bed begins to decline, it must be renewed by applying a lining of fresh horse-dung to its sides: this will be required in about eighteen or twenty days after the bed is made, nor must it be forgot to cover the glasses every night with mats, or long litter: but this should be particularly observed, when the plants begin to appear.

Note. In placing the plants on the bed, care should be taken to set the crowns of the roots upright, and to gather those of each plant close together, so that a bed for a three-light frame may contain, at least, between two and three hundred roots in each light.

The plants for the above purpose of forcing, should not be less than three, nor more than four or five years old.

ASPEN-TREE, a species of Poplar, with roundish, angularly indented leaves, smooth on both sides, standing upon such long slender footstalks, that they are shaken with the least wind; and from this circumstance the tree has acquired the name of the trembling Poplar or Aspen-tree. The culture of this tree is the same with that of the Abele-tree already described. See the article **ABELE-TREE**.

ASPHODELUS, *King's Spear*, a genus of plants ranged by Linnæus under the *hexandria monogynia*, and of which there are three species. 1. Asphodelus with a leafy stalk and triangular fistular leaves generally called the yellow Asphodel. 2. Asphodelus with a naked stalk, and awl-shaped, serrated, and somewhat fistular leaves. 3. Asphodelus with a naked stalk, and sword-shaped smooth leaves. Of these we shall only describe the yellow Asphodel, the culture of that being sufficient for all the rest.

This plant is well known in our gardens, and very well deserving its place in them, specious, and of easy culture; bearing, without shelter, the severity of our worst seasons.

The root is tuberous and yellow; it consists of numerous oblong parts connected to one common head, and hung with thick fibres.

The leaves rise in a vast tuft, and are long, slender, and of a pale green, naturally greyish, often yellowish: they are angulated, edged, hollowed, and sharp pointed.

The stalk is a yard high, round, robust, and perfectly upright.

The leaves are placed irregular on it, and they are like those from the root but smaller, and usually paler.

The flowers are extremely numerous, they form a long slender spike, covering the stalk from the middle upwards, and surrounding it innumerable; buds opening full blown, and fading flowers always clustering close round it together.

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They are placed on a short and slender footstalk, and are in colour of a pure gold yellow. They rise without any cup from the footstalk, and each appears to be composed of six oblong, broad, and pointed petals; but they are really segments of one petal, for the base is entire, and the flower comes off unbroken. In the base of the flower appear six little fibres, which rise from the bottoms of the segments, and form a little globular protuberance.

The filaments are six, and they deserve attention, they are inserted into these films which compose the nectarium; they are smaller from the bottom to the top arched, and of different lengths, three longer and three shorter. Their buttons are oblong, and very conspicuous.

The style rises single in the midst of these from a roundish rudiment of the seed-vessel, and is terminated by a blunt stigma at top.

Culture of this ASPHODEL.

It is a native of the warmer parts of Europe, fringing the margin of little brooks and hanging from the sides of craggy hills where there is a light soil, and some, but not too much moisture.

This must be our rule of propagating it; and very little trouble is required. Let a mixture be made of two thirds light pasture earth, and one third pond mud, add to half a load of this a bushel of cow dung, and the same quantity of wood-pile earth, and mix them well together; chuse a spot in the garden where the morning sun shines freely, and dig in this compost.

In the middle of August procure some parted roots, and plant them at two foot distance, burying the head half an inch. They will require no care but that which is taken in common with every thing in the border; and they will flower the next year. After this to keep them in perfection, they should be every autumn taken up, the side roots cut off and fresh compost put into the place. They are then to be planted at the same distance as at first, and they will thus preserve their full vigour.

The seeds, which ripen freely in round fleshy capsules, will grow as freely in the open ground; but there is no need for the trouble, the plant is so common, and increases so fast by the root, that enough is always ready for that propagation; and there is no advantage in raising it from seed, for it is not one of those plants whose flowers admit a variety of colouring.

Care should be taken not to plant them in small borders, among tender flowers, for they will draw away all the nourishment, and starve every thing else.

Alopecuroides **ASTRAGULUS**, there is scarcely so singular a plant in our gardens as this; and though it can by no means come under the denomination of a flower, few are more elegant. Its whole form pleases the eye, and its hardiness and easy culture are a further recommendation.

Linnæus calls it, upright Astragalus with cylindric spikes of flowers, almost without footstalks, and woolly cups and pods.

The root is fibrous and spreads far. The stalk is round, thick, upright, hairy, and a yard high, of a pale green, not branched, jointed, bent a little from joint to joint, and hollow. The leaves are extremely singular and beautiful. One stands at each joint of the stalk, and they are of the winged or pinnated kind, a foot in length, and narrow. The rib is pale, and covered with a long woolly down. The pinnæ are about four and twenty pair on each, with an odd one at the end: they are oblong, moderately broad, undivided, and of a pale green, covered with the same woolly hairs which overspread the rest of the plant; and the ribs are beautifully twisted, or waved in their course.

The flowers are moderately large, of a yellow colour, and they are clustered together in very elegant thick heads: these are of the size of a hen's egg, and at first they appear much like that form; but as the upper flowers open they become cylindric. They are placed in the bosoms of the leaves, almost without footstalks, and their cups are woolly as the rest of the plant. The woolly matter upon these is white, very long and thick-

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set, and adds greatly to the beauty of the tuft: the pale yellow flowers appearing with a particular lustre as they burst from this silvery bed.

The leaves stand at considerable distances, and these noble heads of flowers rise erect from their bosoms, and run up close to the stalk: the whole plant has a singular, but not unpleasing smell.

Culture of this ASTRAGULUS.

The plant is a native of several parts of Europe, and the seeds of it have lately been received from Siberia. It loves a deep rich mould, and will bear any exposure in our gardens. The seeds ripen very well with us, and the best method of raising the plant is this.

Dig up in the nursery a bed of good mould; and in the latter end of March level the surface, and scatter on some of the seeds saved from a strong plant, and kept dry during the winter. When the plants have some little strength take up the weakest, and leave the others at eight inches distance. Thus let them stand till October, only keeping the bed free from weeds, and in dry weather watering it.

Then let some deep holes be opened in different parts of the borders where the plants are intended to flower; and let the plants be taken up to the full depth of their roots with a ball of their own earth. Let them be planted with care, and the mould be settled about them by a moderate watering. Thus they will root well during the winter, and flower the succeeding year with great strength. They should not be tied up to sticks when they are ripe to stalk, for their stem is of sufficient strength, and there is a pleasing wildness in their free manner of growing.

A S T E R, *Starwort*, a genus of plants ranged by Linnæus under the *syngenesia polygamia superflua*.

Of this genus there are no less than thirty distinct species which are enumerated here; it will be sufficient for us to describe the China Aster, especially as the character of the Aster tribe is so strongly impressed upon it.

The garden scarce affords a more elegant flower than this, when double and well coloured: and there is great advantage in its bearing the open air, and common ground. Linnæus calls it Aster with oval, angulated, and dentated leaves on footstalks; and with broad leafy cups terminating the stalks and branches.

The root is composed of numerous fibres connected to a small head; they are long, white, and spreading; and in proportion as they have room to extend themselves the plant flourishes.

The stalk is round and ridged, of a purplish colour, very much branched, and two feet high.

The leaves toward the lower part are oval, angulated a little, variously indented, placed on footstalks, and of a deep blackish green.

Those on the upper part of the stalks are narrower and have no footstalks; they have several deep notches on the sides; their colour is a somewhat paler green, and their surface rough. Those at the extremities of the branches, and just under the flowers, are narrower yet and paler; they are waved a little at the edges, but they have no indentings. The flowers terminate all the branches, and there are several others on short footstalks, which rise from the bosoms of the upper leaves.

In the single and natural state of the plants they are extremely large and elegant; consisting of a series of violet coloured rays, surrounding a golden disk; but in that improved condition to which the plant is brought by modern culture, the variety and lustre of the flowers is almost beyond imagination. The rays instead of enriching a large disk in a large series, are numerous, and disposed in one range within another with a most pleasing irregularity: in colour they are violet, blue, crimson, or white; or of any of the tincts which painting can produce from a mixture of those three.

In either of these colours, the plant covered with a multitude of flowers on all its spreading branches, affords a most pleasing appearance; and a number of them placed at a moderate distance, with other autumnal flowers between, gives a grace, that scarce any thing equals, advanced season when they flower.

The cup is formed of several ranges of leafy scales.

The flower is composed of a number of tubular floscules, ranged close together in a disk, with a circle of surrounding rays.

The tubular floscules in the disk have the rim cut into five segments, and expanded; and in these are five short filaments, with long buttons which coalesce into a cylinder. In the centre of them stands a single slender style split at the top. This rises from an oblong rudiment, crowned with a little rim, which was the cup of the particular floscule. The rays are long, and broadest in the middle, and they have three indentings at the end. These have at their base a rudiment of a seed, and from it a long slender style with two heads; but there are no filaments or buttons. These are therefore female floscules; the tubular ones in the disk hermaphrodite: both these and the others are succeeded by perfect seeds.

Culture of the China ASTER.

In the middle of March let a hot-bed be prepared for the seeds; and covering it five inches with fine mould, when it is of a due temper, the heat gentle, and the mould warm through, let the seeds be scattered on with an even hand, and a quarter of an inch of the same mould be sifted over them.

When the young plants appear let them be thinned where they rise too close; and from this time let the glasses of the bed be raised more and more every day, that the plants may be habituated to the air. The common error is the keeping them too close in this first bed, and then removing them to another of the same kind.

They should be planted out of the first bed into the open ground, it must be in a well chosen spot, and their success depends upon the hardening them in the very first period of their growth.

If they are drawn up weak, tall, and tender at this time, they will be checked greatly upon removing into the air, and insects will seize on them; they never will have their full bigness, nor their true shape.

Chuse a piece of ground in the seminary that is well sheltered from the cold winds, and open to the morning sun. Let a bed be well dug up in this a full spade deep, and the mould perfectly broke. When the plants on the hot-bed are three inches high, let this bed be marked out into squares of ten inches bigness; and in the evening of a cloudy day, let the plants be taken up, each with a good ball of mould; and holes being opened ready for their reception in this new bed, let them be planted one in the centre of each square.

Let the mould be carefully gathered about them; and give them a moderate watering. Shelter them with a reed-hedge to defend them from the wind and sun till rooted; and promote this by frequent moderate waterings. Every evening let these be repeated, unless natural showers happen. Proportion the quantity of watering to the condition of the mould, it must never be made wet or sappy, nor ever suffered to be very dry.

Once in four days let the ground be broke with a hoe; and if any plant among them appear blighted, let the injured part be cut off; and nature left to her chance for renewing it. It is better to cut down a plant on this occasion, within one joint of the ground, than to suffer it to continue in that diseased state; there will a better plant rise from the bottom than could have been made from the whole.

Six weeks the plants should remain in this bed; and after that they will be fit for removing to the places where they are to flower.

Some keep them longer out of the garden, but it is wrong, for they bear removing worse; and the flower buds being formed, the beauty of the plant is often spoiled by the check they receive at that time.

It is best to have one large bed for those plants, not to disperse them into borders. The inferior kinds may be placed in that manner, but the fine ones should be preserved separate.

When the plants have had six weeks growth in their second bed, let a fine warm spot be chosen for them in the garden, and a bed dug up two spade deep, the mould fine and fresh. At the same time let some holes be opened

ed in different parts of the common borders. Let the bed be marked with lines length-way and across, at a yard distance, and in the centre of each open a large hole.

In a cloudy evening take up the plants out of the nursery bed, each with a good ball of earth.

Such, as in spite of all care have been damaged, are to be planted in the borders: the fine ones in these holes, one plant in each; the mould must be well closed about them, and they must be here as at first, shaded, and watered every evening, till they have taken root.

A showery season is a great assistance, at the time of this transplanting, but if nature withholds this benefit, the gardener must supply its place by frequent waterings.

Though a showery time is a great advantage, he must not defer the work in expectation of it: for on the making this last transplantation in good time, depends the future success of the plants.

When they are well rooted in the new bed, they will require no more care than to have the ground between them at all times kept clear from weeds, and once in ten days very well broke, to the depth of an inch or two, with a hoe. The waterings must also be frequently repeated. In this manner the China-After will be brought to flower, in its full perfection.

AVENUES, are walks planted on each side with trees, leading to some particular place, and terminating in a prospect. All Avenues that lead to a house, ought to be at least as wide as the whole front of the house, if wider, they are still better; and Avenues to woods and prospects, ought not to be less than sixty feet wide. The trees should not be planted nearer to one another than thirty-five feet, especially if they are trees of a spreading kind: and the same ought to be the distance, if they are for a regular grove.

The trees most proper for Avenues with us, are the English Elm, the Lime, the Horse-chestnut, the Beech, and the Abele. The English Elm will do in all grounds, except such as are very wet and shallow, and this is preferred to all other trees, because it will bear cutting, heading, or lopping in any manner, better than most others. The rough or smooth Dutch Elm, is approved by some, because of its quick growth: this is a tree which will bear removing very well, it is green almost as soon, and continues so, as long as any plant whatever. It makes an incomparable hedge, and is preferable to all other trees, for lofty espaliers.

The Lime is valued for its regular growth, and fine shade.

The Horse-chestnut is proper for all places that are not too much exposed to rough winds.

The common Chestnut will do extremely well in a good soil, and rises to a considerable height, when planted somewhat close, though when it stands single, it is rather inclined to spread than to grow tall.

The Beech is a beautiful tree, and naturally grows well with us in its wild state, but it is less to be chosen for Avenues than the before-mentioned, because it does not bear transplanting well, and is very subject to miscarry.

The Abele is fit for any soil, and is the quickest grower of any forest-tree; it seldom fails in transplanting, and succeeds very well in wet soils, in which the others are apt to fail. The Oak is but little used for Avenues, because of its slow growth.

The old manner of planting Avenues was with regular rows of trees, and this has been always followed till of late; but we have now a much more magnificent method, by setting the trees in clumps, or platoons, making the opening much wider than formerly, and placing the clumps at about three hundred feet distance from one another. In each of these clumps there should be planted either seven or nine trees: but this is only to be practised where the Avenue is to be of some considerable length, for in short walks it will not appear so elegant as single rows of trees. The Avenues made by clumps are fittest for parks. The trees in each clump should be planted about three feet asunder, and a trench should be thrown up round the whole, to prevent the deer from coming

to the trees to bark them.

AUGUST, the eighth month of the year; and in which the following general directions should be observed by the gardener.

In the flower-garden transplant the layers of Carnations, Pinks, and Double Sweet-William, which by this time will have taken root, if timely laid. Take great care of the Auricula-plants, and now the Seedling Auriculas will be fit for transplanting. In the parterre clip the evergreens, hedges, and pyramids, which in a wet season will be much wanted. Make layers of all sorts of shrubs and trees, which remain abroad all winter, always observing to lay down the most tender shoots. As the season advances in heat, and the showers are few, the plants of value will require watering, and most of all those in pots; though potted plants bear less water at this time, than those in the full ground, they require it oftener. Continue the care of gathering the seeds of flowers, as they ripen, and lay them in a dry, shady, and airy place, to harden. Continue the care of those seedling plants of the tender kind, which are to take their growth in the stove. Those which have been removed into large pots, will require shade and water, till they are rooted; and those which are yet in the small pots, into which they were planted from the seed-bed, must, as they grow to a due size, be transplanted, and rooted afresh, with the same care. While these are preparing to take their growth in the stove, those which are there already, must be refreshed with as much air as can be safely admitted. Go round the plants in flower, trimming each; if an irregular shoot appears, take it off; take off also all decayed leaves, and let no flower remain which is past its full glow of beauty. Next, go over the ground, between the plants, with a small hoe. Insects are as numerous in the flower garden at this season, as in any other part of the ground: these must be destroyed without hurting the plants, if possible. The tender shrubs, lately inoculated, will now require to have their bandages loosened, that the sap may circulate freely. The flowers of the summer, towards the end of this month, are going off, and those of the autumn coming in. Mark those of the first, intended for seed, and tie them to sticks, and cut down the stalks of the others, or pull up those that are annual, and perish after flowering.

Break the mould about the autumnal plants that are coming to flower, cut off all irregular shoots, pick away dead leaves, and give them every evening a gentle watering. Clear all the borders from weeds, and gather seeds as they ripen, chusing for this purpose the afternoon. See the grass is close mowed, and the gravel clean and well rolled.

In the seminary continue to bud the later kinds of fruit-trees, and look carefully over the stocks, which were budded the preceeding month: the bandages of these must be loosened, that the sap may have free course.

Look carefully to the feed-beds of young stocks for future budding: they must be weeded and watered, and as the plants increase in height, this care must be increased.

Keep your ground clear from weeds between the trees, and train up the several sorts of evergreens, forest-trees, and shrubs, for the several purposes they are designed, but do not trim the stems of standard-trees too close: for if they have not some shoots left on the sides of their stems, to detain the sap, they will not be able to support their heads. Towards the end of this month, you may plant cuttings of Laurels and Honey-suckles: you may also plant cuttings of Gooseberries and Currants; you should also, towards the end of this month, begin to clear and trench the ground, where you intend to plant stocks, or young forest-trees, in autumn. Look carefully to the seedling trees, observe that they do not suffer by drought, and that they are not overborne by weeds, which at this season soon get up to a height.

In the fruit garden look carefully over the wall-fruit-trees, to destroy snails and other vermin, which will gnaw your choice fruits, and spoil them. Hang up
scare-

scare-crows of feathers, or wings of birds, or intire birds with the entrails taken out, to fright away sparrows, and other birds, that will peck your fruit as soon as it ripens, or place lime-twigs about the trees, and now and then fright them, by discharges of a pistol; and where it was not done the former month, you should fix some phials, with honey-water, in different parts of your trees, to destroy the wasps, which will drown themselves; these phials should be fixed before the fruit begins to ripen, when the wasps and flies will be much sooner inticed to the water, than they will after they have tasted the fruit. Where any branches of trees project from the wall, or have been displaced by winds, they should be carefully fastened to the wall in their due position, that the fruit may receive the benefit of the sun to ripen it, but take care not to pull off the leaves of the trees, as this would expose the fruit too much, whereby it would become hard, and seldom ripen kindly, especially when it is done long before the fruit is ripe. Your Vines in the vineyard, and those against the wall, should now be gone over for the last time, pulling off all trailing branches, which have been lately produced, and fastening such branches as are loose in their proper places; you should also observe to keep the ground clear from weeds, between the rows of the Vines, untie the buds of the fruit trees, which were inoculated the last month, otherwise their bandage will pinch the bark of the stocks, and will prevent their growing equally in the part where the bud is put; you should also observe to clear the lower part of your stocks from shoots, and keep the ground clear from weeds, near the roots of the fruit-trees.

In the kitchen-garden you should sow Onions about the beginning of this month, to supply the table early in the spring for sallads, and other uses: and lest the winter should prove severe, it will be proper to sow a few Welch Onions at the same time, as these will endure the greatest colds, when the common sorts are easily destroyed. You should also sow Spinach, to supply the kitchen in winter and spring. About the tenth or twelfth day of this month, you should sow the early Battersea and Yorkshire Cabbage-seeds: for that which is sown before will run to seed in the spring. If the winter is mild, and if it is sown later, the plants will not have strength to resist the cold. About the twentieth day of this month sow some Cauliflower-seed for the early crop, to be planted under hand-glasses and under the walls, where they are designed to stand open.

About the twenty-fifth sow some more seeds for a second crop, to plant under frames, to abide the winter. About the middle, or towards the end of this month, sow some common Cabbage Lettuce, and some brown Dutch Lettuce, to stand the winter, on warm borders, without covering; you may sow also, towards the end of this month, some Cos and Silesia Lettuce, to plant on warm borders, near walls, pales, or hedges. In moist weather transplant Endive and Celery for blanching; and now you may transplant some of the Lettuces, which were sown the former month, to supply the kitchen in autumn. Towards the end of the month you should sow several sorts of seeds, which remain a long time in the ground, and, which if sown in the spring, will often miscarry. The beds of Coleworts, &c. which were sown the last month, should be carefully weeded: and if the plants are too thick, some of them should be drawn out, and transplanted into another spot, that those which remain may have room to grow. Cut off the flowering branches of most sorts of aromatic plants, which are past flowering, that they may make new shoots before winter. Pull up Onions, Garlick, Rocombole, and Eschalots; when their leaves begin to wither and fall, spread them thin, in an airy place, to dry, before they are put up for winter use. In dry weather earth up the large Celery, but so as not to bury the hearts of the plants; tie up the Endives that are full grown, or cover them with boards or tiles, to blanch. All small suckers, which come out on the sides of such Artichokes, as were planted in the preceding spring, should now be cut off, because, if they are permitted to remain, they will starve and weaken the fruit: they should also

be cleared from weeds. Transplant such Brocoli, as was not planted out in the preceeding month, into the place where it is to remain for flowering; and you may yet transplant some Savoy, to come late in the spring. Observe to keep the roots of the Melons from too much wet. The Cucumbers for pickling should now be looked over two or three times a week, to gather such as are fit, because in a short time they will grow too large for that purpose. The Asparagus planted in the former spring, should now be carefully cleared from weeds, as should also your winter crops of Parsneps, Leeks, Beets, and Cabbages. The dunghills should also be cleared from weeds at this season, to prevent the seeds scattering, and being by that means carried into the garden. In this month you may plant slips of aromatic plants, where it was omitted in the spring. Cut such herbs as are now in flower, to distil, or to dry for winter use. Continue to sow the seeds of Cressies, Rape, Turnep, Radish, Mustard, and other kind of sallad herbs, every week, and gather all sorts of garden seeds, which are now ripe. Sow Turneps for a latter crop, any time before the twentieth of this month. Earth up the Finochia, which is full grown, to blanch it, that it may be fit for use; and continue to transplant Celery into drills, that you may have a succession to supply the table all the season.

The spinach which was sown last month for winter use, will now be fit to hoe, and should be cut down where it grows too close.

AVICENNIA, a genus of plants, of which there is no English name, and only one known species; it is one of the trees which give a distinguishing beauty to the Indian forests. It is large and noble, equal to our elms in height, and thickness of the trunk, and full of branches; the bark is rough, and of an olive brown, the wood white and brittle, and the young shoots of a greyish green.

The leaves are very numerous and elegant, large as those of the Laurel, and not unlike them in form: they are placed in pairs, and have short footstalks; their colour on the upper side is a strong green, on the under, greyish: and they are of a firm substance; the flowers crown the extremities of the branches, in large clusters; their colour is a bright yellow, edged with white, and they are very fragrant; each has its small permanent, green cup: this is formed of one piece, and divided into five segments, at the edge; the flower is formed of one petal, which is divided into four segments, of an oval form, but pointed.

In the center rise four short filaments, with divided buttons, and in the midst of them a single style, short, permanent, crowned with a pointed head, and rising from an oval rudiment: this, by degrees, enlarges into an oval fruit, with a point, which in one cell contains a single seed, compressed, oblong, and so full of vigour, that it will shoot out the first traces of root and leaves, while contained in the fruit.

Druggists have long been acquainted with this fruit, under the name *Anacardiums*.

Culture of the AVICENNIA.

The method of raising this elegant tree, is from seed, and the certainty of success consists in obtaining that fresh.

In spring it must be planted carefully, in a pot of fresh mould, covered a quarter of an inch, and set in a bark-bed, which has not too much heat. When the young plants appear, they must be watered: when three inches high, they must be taken up, each with as much of the mould, as can be preserved about it, and planted in separate pots: these must be again set up to the rim in bark, shaded well, and watered lightly, till they are rooted: they must then be inured, by degrees, to bear a little air, and afterwards set out among the green-house plants; they must be watered frequently, and early in autumn taken into shelter.

As they increase in bigness, they must be removed from time to time into fresh pots, of larger size: and every time there must be as much of the old mould preserved about them, as will secure them from receiving any check in the removal: and they should be every time shaded, till well rooted.

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AVOCADO,

AVOCADO, or **AVOGATO PEAR**, a genus of trees, of which there is but one known species.

This tree grows in great plenty in the Spanish West Indies, and in the island of Jamaica: it has been transplanted into most of the English settlements in the West Indies, on account of its fruit, which is not only esteemed by the inhabitants as a fruit to be eaten by way of desert, but as very necessary for the support of life; the fruit of itself is very insipid, for which reason it is generally eat with the juice of lemons and sugar, to give it a piquancy. Some people eat it with vinegar and pepper.

This tree, in the warm countries, where it is planted, grows to the height of thirty feet, or more, and has a trunk as large as our common apple trees; the bark is smooth, and of an ash colour: the branches are beset with pretty large, oblong, smooth leaves, like those of Camel, which are of a deep green colour, and continue on the tree throughout the year.

The flowers and the fruit are, for the most part, produced toward the extremity of the branches.

The fruit is as large as one of the largest pears, inclosing a large seed with two lobes, contained in a thin shell.

In Europe, those persons who delight in collecting exotic plants, preserve this as a curiosity: and though there is little hope of its producing fruit with us, yet for the beauty of its shining green leaves, which continue through the winter, it is well worthy their attention.

It is propagated by seeds, which should be obtained as fresh as possible from the countries of its growth; and if they are brought over in sand, they will be more likely to grow than such as are brought over dry.

Fill some pots with light earth, sow the seeds in these, and plunge them into a hot bed of tanners bark. In five or six weeks the plants will come up: while young they must be treated with great care and tenderness: and when they are about five or six inches high, they should be carefully transplanted: if there are more than one plant in a pot, they must be separated, being cautious to preserve a ball of earth to the roots of each, and plant them in small pots, filled with the same earth as the seeds were sown in, then plunge them into a hot-bed of tanners bark: shade them till they have taken new root, after which time admit fresh air to them, according to the warmth of the season.

Towards Michaelmas remove them into the stove, plunge them into a bark bed, and water them gently twice a week. In spring remove the plants into pots a size larger, and renew the bark-bed with fresh tan, this will refresh the plants greatly. They should be kept in the stove, for, except in the warmest parts of summer, they are too tender to bear the open air of our climate.

AURICULA, *Bear's-ear*, a distinct genus of plants, according to all botanists, except Linnæus, who considers it a species of the *Primula*, or *Primrose*, and ranges it among the *pentandria monogynia*.

The Auricula plant has, of late years, been cultivated with extraordinary care and pains, by the curious in gardening, being in great estimation as it produces a flower of exceeding beauty. It is diversified with a greater variety of colours, and exhibits more properties to complete the idea in the fancy of the florist, than any other species of the blooming vegetable tribes. The flower consists of a bunch, or truss of petals, by florists called pips, supported by as many pedicles, or foot-stems, arising out of the top of the main stalks: the properties of a fine Auricula may, therefore, be distinguished and divided: first, into those that regard the pips, secondly, those which respect the bunch, or truss, and thirdly, those which regard the main stalk.

The petals, or pips of an Auricula, have four remarkable parts: the disk, or outer rim, the eye, or inner rim, the tube, or pipe, and the brush, or thrum, so termed in the language of the florists, but by the botanists called filaments, and antheræ. The properties belonging to the perfection of the pips, are first, the disk, or rim, to be of a lively, good colour, or

colours, such as may suddenly strike and captivate the sight, for on this properly depends the foundation of all the rest. If the colours, therefore, make a faint, or dead appearance, or are of an inelegant, or ordinary tinge, or hue, such a flower is not to be valued, even though all its other properties should be the most excellent, because all the rest are of no other account, but as they assist in the more full and perfect display of this chief one, of colour.

2. The colour, in all painted and brindled flowers, ought to be so equally distributed over the rim, or disk, that there may be an agreeable uniformity amidst the variety, that the sight may not be offended with any disproportion, or see one side remarkably of a lighter, or darker hue, than another.

3. The outer edge of the rim ought to be of a circular figure, or at least so near it, as that the indentures may bear but a small proportion to the breadth of the disk: for when these are deep and wide, and the points of the segments stand in the form of a star, greatly divided, the vacancies will offend the sight with an obvious deficiency and want: the case is still worse in those pips which are subject to run out to a greater breadth on one side of the eye than on the other: this irregularity and disproportion is very disagreeable.

4. The eye, which is the annulus that environs the tube, or pipe, ought to be formed like the disk, either perfectly, or nearly round, and of one entire clear colour, of a strong and pure white, in all painted and brindled flowers, and either the same, or of a bright yellow, or good straw colour, in whole coloured flowers.

5. The eye should be well defined from the disk, that is, it ought not to be mixed with, or shaded into it, so as to occasion any indistinctness between the edge of one and the other.

In flowers, where these two properties of the eye are imperfect, the lively contrast between the rim and the eye, which otherwise, shew each other to advantage, is in a great measure destroyed, though they may be allowed, in some measure, to be blended by the fine meal, or powder, which most Auriculas have a share of, but not so much as to render the edges indistinct.

6. The face of the whole pipp, disk, and eye, ought to be so well opened, as to lie exactly, or nearly flat, for when it either inclines inward, which is called cupping, or throws its extremity backward, both the true form of the flower, and part of the colour, are thrown out of sight, and the whole truss is greatly disfigured.

7. The tube, or pipe, should stand exactly in the center of the pipp, and be truly circular.

8. The tube should be well filled with filaments and antheræ, in the form of a brush, generally called the thrum, rising even with the face of the pipp, for when the style rises only like a pin, without being encompassed with the apices to the same height, the flower is called pin-eyed, and shews a vacancy so very unpleasant to the curious eye of a florist, that such flowers, failing in this central beauty, though they may otherwise have good properties, are held in little esteem.

9. The thrum should be of a bright colour, and the filaments and antheræ, of which it is composed, clear and distinct, for when they seem clotted together, or appear misshapen, and of a dull colour, the beauty of the flower is much hurt and impaired.

10. The rim, the eye, and the pipe, ought all to bear an agreeable proportion to one another, for where any one of these is beheld either too large or too small, with respect to the other two, it will give the sight of a florist great offence: thus, if the rim is too large, the whole pipp will look heavy and clumsy, and the eye will appear narrow and mean: if the rim is too small, it will look abortive, and the eye monstrous: also, if the pipe is too wide, the thrum cannot fill it duly, and it will appear vacant: if the pipe is too small, or narrow, it will seem pinched, and the thrum will not have room, so that there will be an apparent want of due grace, air, and freedom: perhaps the best proportions may be observed where the semi-diameter of the pipe is one, the breadth

breadth of the annulus of the eye, one, and the breadth of the disk, or rim, one and a half.

Second. Of the bunch, or trufs.

11. It is an excellent property of an Auricula to be a good trusser, that is, one which generally puts forth a great number of pips from the main stalk, for by that means the beauty of the flower is greatly magnified, and makes in the whole a most delightful appearance.

12. The length of the pedicles which support the pips in the trufs, should be proportioned to the number and size of the pips they sustain: for if the pedicles are very long, and the pips few and small, there will be unlighty vacancies in the trufs: or if they are short, and the pips many and large, they would be too much crowded together, so that neither the colours can be fully viewed, nor the other properties of the pips fully displayed.

13. The pedicles should be sufficiently strong and firm, that they may not droop with the weight of the pips, nor fall loose in a disorderly manner, but support the trufs entire and close, without either vacancy or crowding, so as to appear one compleat free-blown flower.

14. The pedicles ought to be nearly of the same length, so that the pips may stand together of the same height, and form a regular umbell, or rather corymbus, which is the formal perfection of the trufs.

15. The pips should be all similar, that is, so near of the same size and colour, as not to be easily distinguished from each other, for otherwise the unity and harmony of the trufs will be destroyed, and though ever so perfectly formed, it will appear as if it was made up of pips, taken from different Auriculas.

16. It is an exceeding good property of an Auricula to blow freely, and expand all its pips nearly at the same time, for by this means the colours will appear in them all equally fresh and lively: whereas in those which do not blow some of their pips till others have passed their prime, the whole appearance of the trufs falls much short of that beauty, which would otherwise be seen.

Third. Of the main stalk.

17. The stalk which supports the trufs ought to be strait and sufficiently strong to bear it up without drooping.

18. It is an excellence to be lofty as well as erect, for thereby the trufs, and consequently the whole flower, will make a more stately and grand appearance.

To these eighteen properties which complete the florist's idea of a beautiful Auricula, there ought to be added the graceful display of a good plant, covering the top of a flower-pot with fresh verdure, or foliage of luxurious growth, and an agreeable green colour, such as is expressive of the most perfect health and vigour: this vastly enriches the whole view of the flower and plant, taken together. Moreover, though every Auricula that has the above-mentioned properties, cannot fail pleasing the most curious and critical florists, yet as upon one hand an Auricula may be somewhat deficient in several particulars of small consideration, and yet be justly esteemed a fine and valuable flower: so on the other hand it will be a farther addition to the excellence of an Auricula which has all the properties, that it naturally stands long in bloom, and wears its colours, without fading or alteration; and also when the flower begins to decay, if the colours fade equally, slowly, and gradually, the florists think it an addition to its character, and is by them termed dying well.

The Auricula is propagated both from seeds and slips. The seed should be saved from the finest flowers, which should be marked for this purpose when they are in full bloom.

Chuse for this purpose a large flower, and such as blows regular and perfectly flat; let the colours be lively, with a large and bright eye. The stalk should be tall and strait, with strength in proportion.

Having marked the flowers, let the pots be immediately removed off the stage, and plunge them in a border,

where the plants can enjoy the morning sun freely, till about ten or eleven o'clock, but not longer.

Water them often in dry weather, and suffer no weeds to grow in the pots, or near them; likewise take care that they are at no time too much shaded with any large growing plants, but let them enjoy the free air, and the benefit of the showers of rain.

The seed will be ripe in the end of June, and in July, when you must gather the seed pods according as they ripen, otherwise, they will soon scatter on the ground.

The best soil for sowing these seeds is in good fresh earth from a common, rather light than otherwise, mixed with rotten dung and leaves, which should be well mixed together, laid in a heap for some time, and often turned. With this compost the pots, or boxes, should be filled, and the seeds sown pretty thick on the surface, and covered about half an inch thick with the same mould.

The boxes, or pots, must then be set where only the morning sun comes, stand there till the end of the next month, and then be removed where they can have the full sun.

The seed will scarcely grow before the spring, but the plants will come up earlier and stronger than those sown at that season.

As soon as the plants appear they will not be able to bear the full sun, when it is powerful: they must, therefore be shaded from it occasionally; the boxes wherein they are growing should be removed to the shade, but the place should be open to the morning sun, till about nine or ten o'clock, but shaded the rest of the day, and watered often in dry weather.

About July they must be transplanted from the seed-bed, into a spot defended from the mid-day sun, the ground being first neatly dug, and the surface raked very even.

Let them be planted about four inches asunder each way, observing to close the earth very well about them, and let them be gently watered. They must, after this, be kept very clear from weeds, and in dry weather, moderately watered every two or three days, during the summer season.

The next year many of them will begin to flower, you should therefore, examine all the plants, and such as produce the largest flowers, and have good colours, should be marked and planted in pots for stage flowers; but all the plain flowers, that is, those which have but one colour, should be planted in borders, among other low flowering plants, and those which are planted in pots, should in the following year's bloom be again examined, when you will be better able to judge of their properties: and those of them that do not merit a place among stage flowers, should be transplanted into the common borders, for none but such as are real good flowers, should be placed on the stage.

Auriculas are also increased by the slips, or suckers, which rise from the old plants: and the time to take them off, and plant them is in June; they will now readily take root, and as the plants are now in bloom, you have the opportunity of seeing the flowers, and taking the slips from those you like best. Let each slip be planted singly, in a small pot of fresh earth, and give them a little water as soon as they are planted, then set the pots in a shady place; the plants will take root freely, with the assistance of a moderate watering, now and then.

The propagating these plants by slips, is the only method to encrease the sort you like: for the slip will produce exactly the same flower as the plant from which it was taken, which is not so with the seedling plants: for the principal intention of the florists, by raising them from seed, is to procure new sorts; for there are always varieties obtained from seed, although there may not be one like the flower from whence the seed was saved; and, perhaps, out of some hundreds, very few that have the properties requisite for a real good flower; but those that are curious in flowers, are well satisfied with the acquisition of one or two new flowers, that have all the due properties;

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perties; and as above hinted when any new flower is thus obtained, the next care is to propagate it by the slips or suckers which arise from the side of the main plant.

The pots containing the finest Auricula plants must be well protected from heavy rains, snow, and sharp frosts, during the winter, otherwise the plants will be greatly injured.

They should therefore be always removed about the end of October or beginning of November, and placed in frames, or in a bed arched over with hoops in a warm part of the garden, where they can be occasionally covered if the weather is unfavourable; but let the covers be constantly taken off when the weather is mild and dry.

Towards the end of January, if the weather be mild, it will be necessary to add fresh earth to these plants.

Let some proper compost be prepared for this purpose. Clear the plants from dead leaves, and take the old earth away from the top of the pots, as low as you conveniently can without disturbing their roots; fill up the pots with the earth that you have prepared, then return them to the place intended for sheltering them. Let them always be secured from frosts and excessive rains; but a moderate shower will be serviceable to them.

As the spring advances, the choice kinds of Auriculas in pots must be treated with more than ordinary care, for their flower buds will begin to appear in February; the plants therefore should be defended from frost cold heavy rains. This must be done by a covering of mats, canvas, or glass; but every mild and dry day, the plants must be entirely uncovered. As the spring advances the plants should not be debarred from a warm and moderate shower of rain now and then, if such should happen, for it will be of great service to them. When the weather is dry let them be refreshed moderately with water at times, just enough to keep the earth a little moist about their roots. At the same time remember to keep the pots free from weeds, and the plants from decayed leaves.

In April the Auriculas will begin to blow; care must therefore be taken to protect the curious sorts from rain and wind, and also from too much sun.

The mealy dust, which covers these flowers, compose a principal part of their beauty; this must therefore be preserved upon them; the least shower of rain would easily wash it off; it is also liable to be blown off by the winds; and the sun, if permitted to shine freely on the flowers, would occasion them soon to fade. Let the pots therefore, according as the flowers open, be immediately removed and placed on the shelves of the Auricula stage, or where the flowers may be protected occasionally from such weather as would deface their bloom.

The stand or stage should have from three to six ranges of shelves, about six inches broad, rising theatrically one above another, from the front; the back being generally placed against a wall, pale, or other building; it must be constantly covered at top, but the front and two ends must only be covered occasionally, there should be some canvas or mats fastened to the top of the front and ends, by way of curtain; this should be so contrived that it may be readily let down and drawn up at pleasure.

When the air is very sharp, or high winds, or driving rains, the curtain must be let down at such times to shelter the flowers; but when the weather is mild and calm, let the front be constantly open.

The curtain should be also used occasionally to shade the flowers from the sun, when it shines fiercely. Observe in this case, to let the curtain down but just as low as necessary to shade the plants, and never let the curtain remain longer down than is absolutely necessary for the defence of the flowers.

When the pots are placed on the stand, let them be examined at least once every day, to see where water is wanted; and let such pots as stand in need of it be immediately supplied. In doing this let no water fall on the flowers, for that would also wash off the dust. Let the water be always given in moderate quantities.

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By thus placing your Auricula pots on a covered stage, it not only preserves the flowers much longer in beauty, but you also more readily view them, and they shew themselves to much greater advantage than when placed on the ground.

Keep the surface of the pots perfectly neat, free from weeds, and every sort of litter; suffer no decayed leaves to remain on the plants, but let such, as soon as they appear, be taken off.

In August, the plants should be shifted into fresh earth, prepared as above directed, and broken very small between the hands.

The compost being ready, take up the pots one by one, and pick off all decayed leaves from the plants; then turn the plants out of the pots, take most of the earth from its roots, and let all the fibres be trimmed: this done, fill the pot nearly with the compost, immediately set the plant in the middle, close the earth well about it, and fill up the pot properly with more compost.

When the whole are thus planted, let them be moderately watered, and the pot set in a shady place, or the plants shaded occasionally with mats, and watered occasionally in dry weather till they have taken root. But if much rain should fall, the plants must be defended from it; for much wet is destructive to Auricula plants.

In order therefore to protect the choicer kinds of these plants in such weather, let the pots be placed close together, in a bed arched over with hoops; and when the weather is excessive wet, let some large thick mats or canvas be drawn over the hoops to defend the plants; or the pots may be set close together in a garden frame, and the glasses may be put on as occasion requires.

The above is a much better and more certain method, of protecting the plants from wet, than to lay the pots down on one side. But where there are no such conveniencies, it will, in that case, be proper to lay the pots down to prevent their receiving too much moisture which would rot the plants.

When the bloom is nearly over, let the pots, according as the flowers fade, be immediately moved off the stand or stage, and placed upon a clean level spot, where the plants can enjoy the morning sun freely, till nine or ten o'clock but not longer; there let them remain till the latter end of August. Keep the pots, and the ground where they stand, perfectly clear from weeds; and when decayed leaves appear on the plants, let them be immediately taken off, and, in dry weather, let the plants be often refreshed with water.

When the cold weather comes on, and you have not the convenience of a garden frame, let the pots be set close together, in a bed about four feet wide: and if the earth be dry, plunge them; then place hoops across, and in bad weather let mats be drawn over them. But in dry and open weather, let the plants be constantly uncovered, even in the night.

AXIS of a Plant, the term of botanists for that long, round, smooth cylinder, placed in the centre of the juli, or cat's tail, on nut trees, &c. about which the male organs of generation are disposed.

XX

B.

BACCIFEROUS, a term applied to trees, shrubs, or plants, that produce berries.

BALM of Gilead, one of the species of *Dracocephalum*, or *Dragon's-head*. See the article **DRAGON'S-HEAD**.

This plant is of the perennial kind, and much esteemed for the agreeable scent of its leaves.

In April sow the seeds on a common hot-bed; they may be sown in a bed, or border of natural earth, but the former is the most advisable method, as the plants thus raised will be forwarded greatly in the spring, and flower sooner by three weeks,

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This plant may likewise be propagated by cutting off the stalks. If there have been plants preserved in frames or the green-house all winter, some of them will have stalks proper for this operation in April, or, if not, they will have produced strong ones by the middle of June; cut some of the strongest off, and divide them into lengths of six inches; plant these in shady borders, four or five inches distant from each other; they will readily take root, and be fit to transplant in two months.

If you intend to preserve the plants through winter, they must be placed either in the green-house, or a garden frame, and defended with glasses and other coverings in severe weather. Thus protected they will continue green all the winter.

BALSAM, or *Female Balsamine*, a species of a genus of plants called *Impatiens*, ranged by Linnæus among the *syngenesia monogynia*.

This plant is a native of India, and has several varieties, as the white, the red, and the striped flowered, also the single and double flowering; these sorts are so hardy as to rise in the full ground, and when the seeds scatter, the plants will come up the following spring; but these do not flower so early as those raised upon a hot bed; but they are generally stronger plants, and continue in flower longer than the others, consequently they are an ornament to the garden in autumn, when there is a scarcity of flowers.

The flowers spring from the joints of the stems, and are sustained upon slender footstalks, about an inch long, each sustaining a single flower, which is composed of five large unequal petals; they have a long tail at their base, somewhat crooked; these are succeeded by an unilocular capsule, opening with an elastic force in five valves: the seeds it contains are fixed to the axis, or placenta.

The most beautiful and valuable kind are those which produce double flowers, of which there are three sorts, finely striped with pink, scarlet, or purple, so as to appear almost as beautiful as a Carnation, and are highly valued by the curious. These plants are raised on hot-beds in the spring, and managed nearly as the *Amaranthus*. See the article **AMARANTHUS**.

As these flowers are apt to degenerate, so as in a few years to become single; the best method to preserve their plentitude of petals, is by changing seeds with some person who lives at a distance, and can be depended upon for his care in the choice of blossoms for seed; for all single flowers should be plucked off as soon as they open, as well as all the double flowers, which are but of one colour, preserving those only which are double and striped.

BANE-BERRIES, *Herb-Christopher*, *Actæa*, a genus of plants placed by Linnæus among the *polyandria monogynia*, and of which there are three species; 1. Bane-Berries with ovated clusters, and baccated fruit being the common Herb Christopher, or Bane-Berries. 2. Bane-Berries with long clusters, and an one capsuled fruit. 3. Bane-Berries with paniculated clusters, and a four capsuled fruit.

This plant has perennial roots; the first species has two varieties, and is a native of England, and many other countries, both in Europe and America. It is propagated by seeds, which must be sown soon after they are ripe, on a shady border. The autumn after the plants are come up, you must transplant them to the place in which they are designed to remain. The second species grows naturally in Florida, Virginia, and Canada, and may be propagated by seeds, in the manner of the first sort, or by parting the roots in autumn, when the leaves begin to decay. It will require a moist soil, and a shady situation. The third sort grows naturally in Siberia, and may be propagated by seeds in the manner directed for the first species.

BARBADOES Flower Fence, or, *Spanish Carnations*, *Poinciana*, a genus of plants of which we have but one species in the English gardens, called Barbadoes Flower Fence, with double spines, and ranged by Linnæus among the *Decandria monogynia*.

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There are two varieties of the Barbadoes Flower Fence, which were discovered by the late Dr. Houstoun, in the Spanish West Indies. One of these hath a red, and the other a yellow flower, but as there appears to be no other difference in the plant from the common sort, they must be supposed only accidental variations, which have arisen from seeds.

This plant grows naturally in both Indies; it is planted in hedges, to divide the lands in Barbadoes, from whence it had the title of Flower Fence; it is also called Spanish Carnation by some of the inhabitants of the British islands. It rises with a straight stalk, from ten to fifteen feet high, covered with a smooth grey bark, and is sometimes as thick as the small of a man's leg, dividing into several spreading branches at the top, which are armed at each joint with two short, strong, crooked spines, and are garnished with decompound winged leaves, each leaf being composed of six or eight pair of simple winged leaves, the lower pair being composed of four or five pair of lobes, the others gradually increasing their number toward the top, where they decrease again, and are smaller; the lobes are of a light green colour, and when bruised, emit a strong odour.

The branches are terminated by loose spikes of flowers, which are sometimes formed into a kind of pyramid, and at others, they are disposed more in form of an umbel. The footstalk of each flower is three inches long; the flower is composed of five petals, which are round at the top, but are contracted to narrow tails at their base; they spread open, and are beautifully variegated with a deep red or orange colour, yellow, and some spots of green; they have a very agreeable scent. In the center of the flower is situated a slender style, above three inches long, upon which the germen sits, and is accompanied by ten stamina, nearly of the same length with the style, terminated by oblong summits. After the flower is past, the germen becomes a broad flat pod, about three inches long, divided into three or four cells, by transverse partitions, each including one flat irregular seed. The leaves of this plant are used instead of Sena in the West Indies, to purge, and from thence the plant is by some persons entitled Sena.

The seeds of this plant are annually brought over in plenty from the West Indies, which, if sown upon a hot-bed, will rise easily; when the plants are come up, they should be transplanted each into a small pot, and plunged into a hot-bed of tanners bark, observing to shade them from the sun, till they have taken root; after which they must have air in proportion to the warmth of the season, and be frequently refreshed with water. When the plants have filled the pots with their roots, they should be taken out, and placed in larger ones, that they may have room to grow. If care be taken to water and shift them as often as it is necessary, they will grow to be three feet high the first season. At Michaelmas the pots should be plunged into a fresh hot-bed of tanners bark in the stove, which should be kept to the Pine-apple heat, marked on the botanical thermometers, and frequently refreshed with water, but they should not have too much water in winter. The earth, which these plants should be planted in, must be fresh, light, and sandy (but not over rich) in which they will stand the winter better than in a stronger soil.

These plants must constantly remain in the bark stove, where in warm weather they should have a large share of air, but they must not be exposed to cold; if damp seizes their top, it very often kills the plants, or at least occasions the loss of their heads. With proper management they will grow much taller here than they usually do in Barbadoes, but their stems will not be larger than a man's finger, which is occasioned by their being drawn up by the glasses of the stove.

BARLEY, *Hordeum*, a genus of plants classed by Linnæus among the *triandria dyginia*, and of which there are several species, but as it is cultivated only in fields, we shall make no farther mention of it in this work.

BARK, in the anatomy of plants, is the exterior part of trees corresponding to the skin of an animal.

The bark of plants is two fold; the outer, liber, and the inner, alburnum. The outer Bark is dry, and in some trees rough. The inner is probably a superadded new coat of that year's growth, between the woody and barky nature. The Bark of the trunk consists of skin, a cortical body or parenchyma, and some fibres of the woody part intermixed. The skin is the production of the cuticle in the seed, and the cortical body, an augmentation of the parenchyma of the plume. The skin is originally composed of small vesicles or bladders clustered together, which, as the plant grows, dry up and disappear. The body of the Bark consists of parenchyma and vessels, the former composed like the skin, of clusters and bladders. The vessels are of divers kinds, ro-rifrous, lymphæducts, and refiniferous. The Bark of roots is sometimes yellow, as in Dock; sometimes red, as in Bistort; but oftener white. It is derived from the seed itself, being only the extension of the parenchyma of the radicle. It is variously sized, being sometimes very thin, as in the Jerusalem Artichoke, and in most trees; sometimes it is thicker, and makes the greater part of the substance of the root, as in Asparagus and Dandelion. In Beet Root the Bark scarce exceeds a thick skin, whereas in a Carrot, it is half the semidiameter of the root, being in some places above an inch over. This too is found common to the generality of roots, that their Barks are proportionably thicker at bottom than at top. The inner part of the Bark we have observed annually, lignifies or turns to wood. The Bark of a tree is found each year to divide and distribute itself two contrary ways: the outer part gives towards the skin, till it becomes skin itself, and at length falls off, like the scales of dandriff of our body, or the exuviae of serpents; while the inmost portion is yearly distributed and added to the wood. The Bark is found truly continuous to the body of a tree, as the skin of our body is to the flesh; contrary to the common opinion, which imports, that the Bark only surrounds the tree, as a scabbard does a sword, or a glove the hand; which seems confirmed by the easy slipping of the Bark of Willow, and most other trees, when full of sap, from the wood. Their continuity is effected by means of the parenchyma, which is one entire body, running from the Bark into the wood, and thus uniting both together. The reason why the Bark slips so easily from wood is, that most of the parenchymous parts are young vessels, formed every year successively between the wood and the Bark. *Grew's Anatomy of Plants.*

That trees only live by the ascent of the sap in or between the Bark and the wood, and that if a circle be drawn round any tree (except, perhaps, Ash) by incision to the timber, how thin soever the knife be, provided no part of the thickness of the Bark remain uncut, the tree will die from that part upwards, has been the standing doctrine of naturalists of all ages, and is delivered for fact by Pliny, and others. Dr. Plott asserts this to be a popular error, from the instance of a large old Elm in Magdalen College grove, quite disbarked round at most places two feet, at some four feet, from the ground, which yet grew and flourished many years, as well as any tree in the grove. What is more, it was without all pith, being hollow within as a drum; and the same is confirmed from the history of the Elm in the Thuilleries, related by M. Parcut, which lived and put out leaves, though intirely stripped of Bark from top to bottom. Add, that the Plane and Cork trees divest themselves yearly of all their old Bark, and acquire a new one, as snakes do their skins; and in the change from one to the other, it is evidently not by the Bark that they are nourished. Some infer from hence, that the Bark never feeds the wood. Dr. Plott is more reserved in his conclusion, arguing only, that hence it seems to follow, that there must be other vessels besides the sap vessels of the Bark, capable of the office of conveying sap. It is probable, when the ordinary conveyance fails, some of the woody part, which had all once been sap vessels, resumes its antient office; or as the author last mentioned conjectures, they still so far retain their office of conveying sap, as to keep a tree alive, though not to augment it; which may perhaps, be one different use of those sap

vessels in the wood from those in the Bark, the former being sufficient for the continuation of a tree, and the latter serving only for its augmentation.

Mr. Brotherton has given some new experiments, which seem to decide the controversy, and shew that the Bark is not the vehicle of vegetation: he hacked a Crab-tree round, with a hatchet, so as, besides cutting off the Bark, to cut pretty deep into the wood, about four inches width; yet, the same year it was observed to increase very considerably in thickness, above the said hacking, and shoot, in length of wood, about one foot: the next year it also grew considerably, and shot in length, five inches; the third year it died to the root. The same was found in another tree, part of whose Bark was eat off by the canker: the lower part stood without increase, and by degrees the wood rotted; the upper part increased to the third year, and then died. Mr. Magnol mentions an Olive-tree, from which a circular ring of Bark being cut away, the tree that year bore, above the place of incision, double the quantity of flowers and fruit, which it used to bear. M. Reneaume relates a fact near a-kin to this: in the country, about Aix and Marseilles, when an Olive-tree grows old, and almost ready for felling, they have a method of making it first yield all the fruit which it is capable of producing, by cutting a circular ring of Bark an inch broad, from one of its young branches, and in its place putting an equal ring of Bark, taken from the branch of a young bearing Olive-tree; the effect of this engraftment is, that the branches of the old tree bear plentifully the ensuing year, and those of the young one die away. From the whole, Mr. Brotherton concludes that the sap, most of it, if not all, ascends in the vessels of the woody part, and not by the Bark, nor between the Bark and the wood.

M. Leuwenhoek, on the other hand, has given several experiments and observations with the microscope, to shew that the Bark of trees is produced from the wood, not the wood from the Bark. In reality, if the origin and nourishment of the Bark came from the root, it would seem to follow, that the parts of the Bark near the root should be found larger, and ramified into smaller and smaller, as they grow higher, as the arteries and nerves are, the farther they go from the heart and brain, whereas there is no difference between the Bark of the root and trunk. Besides, the vessels of the Bark of several trees, as the Birch, Cherry, Peach, &c. run not upwards, as they do in the Ash, Oak, Elm, Nut, Apple, Pear, &c. but circularly round the superficies of the tree; and all Bark, whose vessels run upwards, grows thicker as the tree increases, the outside cracking, grows dead, and sticks to the young Bark underneath, which is the only living part of the Bark. The contrary is evident in those Barks, the vessels of which run round, the tree increases, the vessels not being able to stretch or separate from each other, must necessarily break asunder; so that the old Bark is easily separated, and falls off from the new. Hence it is that such trees have always a very thin Bark, as is most evident in the Birch-tree.

Yet M. de Reneaume defended the antient system of the use of the Bark, and shewed that most of the instances above alledged, are consistent therewith. The parts of a tree, separated from the whole, he observes, may carry with them a stock of nutritious juice, whereby they vegetate: thus the branches of Elder, Willows, &c. being cut off, do, nevertheless, produce leaves and young branches, even without setting them in the ground; and pieces of seemingly dry wood, have been sometimes known to do the like; how much more then may branches, which still grow on the tree, and which of consequence can never be so entirely defrauded of new sap, continue to vegetate; for though none be supposed to raise by the Bark, which is entirely cut away, and which was the part that before furnished the greatest quantity, they may still receive some by the woody part, and more especially by the alburnum, or inner rind, which is the softest part, as well as the newest, and that likest Bark. Thus we may suppose it to have been, that the Elm in the Thuilleries continued to grow without Bark

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Bark a whole summer, by virtue of the stock of juice it had already imbibed. For the Olive-tree mentioned by M. Magnol, it was the better enabled to subsist without Bark, as it is of an oily nature; and that even its wood is saturated with that juice, which it is known will keep long, and spend itself slowly. The reason of its increased fertility seems to be, that the canals of the young Bark grafted on it, being more free and open than those of old ones, perform their filtrations better. As to the Elm of Luxemburgh, cited by the same M. Parcut, whose upper parts appeared stripped of all their Bark, almost to the ground, upon a nearer examination, it was found to have fibres of the inner Bark or liber still remaining, which had a communication with the Bark, which communicated with the branches; and it is probable, by these fibres, that the upper branches of the tree were still fed; these fibres, by length of time, and the plenty of juice they had transmitted, were hardened, and began to form a new ligneous substance; other younger fibres of the same liber, and which has probably been formed since the barking of the tree, began to constitute a new alburnum, which began likewise to be covered with a new Bark, or skin. From this instance M. Reneaume concludes that it is of the Bark the alburnum is formed; and as the alburnum is the wood last formed, the whole wood is of consequence formed of the Bark or liber. The manner of this conversion is described by him.

While the alburnum retains any degree of its softness, and still partakes of its barky nature, it may preserve the vegetation for some time; but when it is become absolutely wood, it can no longer contribute thereto. The growth of the young branches is most quick, and the only that reaches to the flowers and the fruit, as being little other than Bark itself. It seems now certain, from the experiments of M. de Buffon, that trees stripped of their Bark the whole length of their stems, die in about three or four years.

BAROMETER, an instrument for estimating the minute variations of the weight, or pressure of the incumbent air; it is a long tube of glass, hermetically sealed at one end, and being filled with quicksilver, is inverted, so as to have the open end of it immersed, or dipped in stagnant quicksilver, contained in a large glass under it, which large glass being exposed to the pressure of the outward air (after such immersion) and the quicksilver in the tube suffered to run as much as it will into the stagnant quicksilver, in which that mouth, or open end, is immersed, there is wont to remain a quantity of quicksilver suspended in the tube, about twenty-eight, twenty-nine, or thirty inches high, measuring from the surface of the stagnant quicksilver perpendicularly: but more or less, within such limits, according as the weight or pressure of the air, incumbent on the external stagnant quicksilver exposed to it, is more or less, leaving the upper part of the tube void, or at least empty of common air.

Barometers will be of particular use to gardeners and farmers, by assisting them to foretel the great alterations of the weather a day or two before they happen, which is frequently of great service, particularly to the farmer, who may begin to mow his grass, when he finds there is a prospect of fair weather, or postpone it a few days, till he foresees a likelihood of such; the same also may be of great use in reaping his corn, as also in sowing his grain, and most of his other business; therefore, the use of this instrument should be more generally known by the practical farmer and gardener.

The rules and observations made for knowing the weather, by the various rising and falling of the weather glass, or Barometer, are these: 1. That the least alterations in the rise and fall of the mercury in the tube, should be regarded, in order for the right finding the weather by it. 2. The rising of the mercury presages fair weather, as the falling indicates the contrary, viz. rain, snow, high winds, and storms. 3. In summer, if the quicksilver be up about fair, and the weather very hot four or five days, then we may expect black clouds to rise, and a brisk gale, with thunder, and a shower or

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two which will soon go off. 4. In winter, the rising presages frosty weather, if the mercury falls three or four divisions, there will certainly follow a thaw; but in a continued frost if the mercury rises, it will certainly snow. 5. When foul weather happens soon after the falling of the mercury or quicksilver we are to expect but little of it; and judge the same with respect to fair weather, shortly after the mercury has risen in the like manner. 6. In foul weather, when the mercury rises much and so continues two or three days before the foul weather is over then may we expect a continuance of fair weather to follow. 7. In fair weather when the mercury falls much, and continues for two or three days before the rain comes, then we may expect a great deal of wet, and high winds. 8. An unsettled state of the mercury denotes uncertain and changeable weather as sun-shine, some black clouds, with frequent showers. 9. If the mercury be up at fair and does not fall, and it happen to rain, then we may expect but little of it. 10. If the mercury be down at rain, and does not rise, and the weather proves fair, then we may expect it not to continue. 11. We are not strictly to mind the words that are engraven on the plates, though for the most part the weather will agree with them; for if the mercury stands at much rain, and does rise up to changeable, it presages fair weather, although it is not to continue as it would have done if the mercury was higher; and so on the contrary.

BASIL, *Ocimum*, a genus of plants ranged by Linnæus among the *didynamia gymnospermia*; and of which there are five species. 1. Basil with fruitful spikes of flowers, on the sides of an erect stalk. 2. Basil with oval smooth leaves, and hairy cups. 3. Basil with oval entire leaves. 4. Basil with oval, oblong, sawed leaves, and heart-shaped, concave, reflexed bractea. 5. Basil with spear-shaped, sawed leaves. These are annual plants, and natives of India. One of the species called Bush-basil, has a fibrous, small root, with a stalk about six inches high, spreading out into branches that are woody; forming an orbicular head; the leaves are like those of Marjoram, of a purplish cast, standing opposite on short footstalks; the flowers are produced in whorles toward the top of the branches, of a white colour and purplish cast; they consist of labiated petals, whose crest, or upper-lip is erect, roundish, notched, and larger than the beard of the lower lip, and cut into five parts; the calix is cut on the edges into four parts, the uppermost of which is hollow like a spoon, and the pistil which rises out of it is attended with four embryoes, which afterwards become as many seeds. This and the common sort are both propagated by seeds, which should be sown in the beginning of April on moderate hot-beds; and when the plants are up, they should be removed to another, observing to shade them till they have taken root: in May they should be taken up with a ball of earth to the roots, and transplanted either in pots or borders. These plants have a strong scent like cloves, too powerful for most persons, but to some they are very agreeable.

BASON, a cavity dug in the ground of a round, oval, square, or other figure, lined or laid with stone, flint, or flags bound with cement or lead, and bordered with turf, marble, or the like, serving to receive the water of a jet d'eau, or to supply the occasions of the gardener. A bason is generally surrounded with a balustrade of stone, marble, brass, or the like; and some basons, whose borders being of marble or other stone, have a trench cut in them, from whence, at certain distances, springs out a thread of water, which lines the trench, and forms a kind of nape or girdle, around the balustrade. Basons in gardens are either for ornament or use. When there is a jet d'eau in the middle, the bason must be always so proportioned to the height it throws the water, as to be capable of receiving it when blown about by the winds, that it may not damage the walks. The usual depth of basons is from two to three feet, this being sufficient to secure the bottom of the basons from frost. If they are intended to hold fish, they should be four or five feet deep. Basons are made either with

with clay, cement, or lead; but they are usually made with clay. In the making them this way, the diameter must be made four feet longer on each side than the basin is to be. This will be taken up by the walls and clay. For this reason it must be dug two feet deeper than the intended depth of the water, for it must be laid over eighteen inches thick with clay, and six inches with gravel and paving. The wall should be made with shards, rubbish or flints, with the natural earth for mortar; work the clay well, and tread it firmly down with the feet.

When they are made with cement, allow one foot nine inches every way for the work; the banks must be cut perpendicularly, and a wall of masonry raised a foot thick, made of pebble stones, laid in mortar of lime and sand: the bottom must then be covered to the same thickness; and the solid lining of the cement is to be backed up against the walls, and over the bottom. This is to be made of small flints in beds of mortar made of lime and cement. When this solid is eight inches thick, it must be plastered over the whole surface with cement well sifted before it is mixed with the lime; and with this it should be wrought over smooth with a trowel. The proportion of this cement should be two thirds of the cement or powdered tile to one third of lime; and this cement has the property of hardening so under water, that it will become like stone, and will not be subject to decay for a long time. After the finishing, the basin must for four or five days be anointed over with oil or bullock's blood, to keep it from cracking in the drying; and after this the water should be let in. The leaded basins are made with walls a foot thick, and a bottom of half a foot. This must be of rubble stones cemented with plaster; for the lime would injure and eat the lead. The sheets of lead are to be spread over these walls and bottoms, and seamed with solder. These basins are but little in use, from the expence of making them, and the danger of the lead's being stolen. The waste pipes of fountains ought always to be made large enough, for fear of choking. When the waste water is to be carried off into common sewers, it may be carried away in drains, or earthen pipes; but when it is to serve for basins that lie below it, is to be conveyed in leaden ones.

BATCHELOR'S BUTTON, a species of the *Lychnis* or *Campion*, with male and female flowers on different plants, and ranged by Linnæus among the *decandria pentagynia*.

They are perennial plants and much cultivated in our gardens for the sake of their flowers; they are hardy and easily propagated either by parting the roots, or by seeds.

The roots should be parted in the latter end of August, or beginning of September, and planted in a light, dry soil.

If they are to be raised from seed, they should be sown in March upon a bed of light fresh earth, and in May the young plants should be removed into another bed of the like earth, at about six inches distance from each other, and watered till they have taken root, after which they will require no farther care, but to be kept clear from weeds; and at the end of September following they may be removed for the last time, into the borders where they are to stand, and they will flower in the June and July following; when, if they are suffered to ripen their seeds, they will sow themselves and come up without any farther trouble.

BAUM, *Melissa*, a genus of plants, ranged by Linnæus, among the *didynamia gymnospermia*, and of which there are seven species: 1. *Melissa*, with whorled bunches of flowers, proceeding from the sides of the stalks, and single foot-stalks, being the garden, or common Baum. 2. *Melissa*, with foot stalks arising from the wings of the stalk, which are divided by pairs, and are of the length of the flowers. 3. *Melissa*, with foot stalks, arising from the wings of the stalk, which are divided by pairs, and are of the length of the leaves, being the common officinal Calamint of the Germans. 4. *Melissa*, with foot-stalks, which are divided by pairs, and

are longer than the leaves, and a declining stalk. 5. *Melissa*, with spikes of flowers, terminating the stalks, and growing upon short, single foot-stalks. 6. Shrubby *Melissa*, with slender twig branches, and leaves which are woolly on their under-side. 7. *Melissa*, with glomerated whorls of flowers, of the length of the stalk, and woolly leaves.

The first species grows naturally on the hills near Geneva, and in some parts of Italy. It has a perennial root, and an annual stalk, and is propagated by parting of the roots, which should be divided into small pieces, with three or four buds to each, and planted in October, two feet apart, in beds of common garden earth; the only culture it requires, is to keep it clean from weeds, and to cut off the decayed stalks in autumn, stirring the ground between the plants. The second species is a perennial plant, and a native of Tuscany, and is propagated in the same manner with the first species.

The third sort is also perennial; it grows naturally in Italy, Spain, France, and England, and is seldom admitted into gardens, though it may be propagated in the same way as the common Baum. The fourth kind grows wild in many parts of this country. The fifth is a native of France, and is easily propagated, by suffering the seeds to scatter. The sixth species is a biennial plant, and a native of Spain: it may be propagated by cuttings, which if planted in the summer, and shaded from the sun, will take root very freely. The seventh species is an annual plant, which may be propagated, by sowing the seeds upon a bed of common garden earth.

BAUM of Gilead. See **BALM of Gilead**.

BAY-PLUM, *Guayava*. See the article **GUAY-AVA**.

BAY-TREE, *Laurus*, a genus of plants ranged by Linnæus among the *enneandria monogynia*, and of which there are eleven species. 1. Bay-tree, with oval oblong leaves, marked with three veins united together, or the Cinnamon tree. 2. Bay-tree, with spear-shaped leaves, with three veins, which unite above the base, called the Cassia. 3. Bay-tree with oval, spear-shaped leaves, marked with three veins, which unite above the base, or the Camphire tree. 4. Bay-tree, with ever-green, spear-shaped, veined leaves, and flowers cut into four points, which are male and female, and is the common Bay-tree. 5. Bay-tree with evergreen, veined, spear-shaped, plain leaves, branches with tubercles and cicatrices, and flowers growing in bunches. 6. Bay-tree with evergreen, coriaceous, oval leaves, transversely veined, and flowers growing in bunches. 7. Bay-tree with spear-shaped leaves, transversely veined, with the cups of the fruit baccated. 8. Bay-tree with oblong, acute, pointed, veined, annual leaves, and winged branches. 9. Bay-tree, veined, acute, oval, entire, annual leaves, or the Benjamin-tree. 10. Bay-tree with entire leaves, furnished with three lobes, or the Saffras tree. 11. Bay-tree with veined, oval, obtuse leaves.

The first three species are natives of the East-Indies; and are too tender to thrive in the open air in this country; they are best propagated by sowing the berries in pots and plunging them in a moderate hot-bed: they should be inured to the open air in June, where they may remain till autumn. The common Bay-tree is a native of Greece and Italy. It thrives here in the open air, and is seldom hurt, except in very severe winters; it will make a variety in all ever-green plantations; and as it will grow under the shade of other trees, where they are not too close, it is very proper to be planted in the borders of woods, where it will have a very good effect in winter; it may be propagated by layers, but the more common method of propagation is by suckers in nursery beds, six inches asunder each way; these in two years time, will be fit to be planted where they are designed to remain. The fifth species is a native of Virginia and is kept here in pots and tubs, and is propagated by layers, or by sowing the seeds, and should be treated like the first three sorts. The sixth species is a native of south America. The seventh and eighth grow in Carolina and Virginia. The ninth and tenth grow also in North America, and are propagated by sowing of the

the berries, or by layers; but these plants do not produce seeds in England. The eleventh species is a native of Jamaica, Barbadoes, and Carolina, and will not bear the open air in this country.

BEAN, *Faba*, a genus of plants, placed by Linnæus among the *diadelphia decandria*, and of which there are seventeen species, but that mostly cultivated here, is the Bean with an erect stalk; and foot-stalks without cirrhi.

The sorts of Bean commonly sown in our gardens are the small Lisbon, or Mazagan, the Spanish, the Sandwich, and the Windsor Beans.

The first is the best known sort of early Beans. The second is a little later, but being a good bearer, is frequently planted. The third sort comes soon after the Spanish, and being hardier than the Windsor Bean, is commonly sown a month sooner. The fourth is preferable to all other sorts for the table. It is seldom sown before Christmas, for it will not bear the frost like the rest, but is generally planted for the great crop in June and July.

All early Beans should be planted in October, and placed under warm walls and hedges, where there are no fruit-trees, for they would prejudice the trees greatly.

If the winter should prove severe, the Beans must be covered with pease-haulm, fern, or some other light covering, observing to take it off when the weather is mild. We would also advise the gardener to cover the surface of the border with tanners bark, which will be of great service in protecting the roots of the Bean from injuries they might otherwise receive from the frost.

If fresh seeds can be obtained from abroad every two years, they will be preferable to those raised here; for they degenerate greatly in earliness, if not in goodness.

The Sandwich Beans may be sown the latter end of December, and the Windsor about a month after; these Beans must have an open ground. Plant them in rows, allowing two feet and a half between each row, and four inches between each seed. If the place is surrounded with hedges and walls, the distance must be greater, else the stalks will run high, and bear very little fruit.

The first plantation of Windsor Beans should be made in the middle of January; after which a new one should be made every three weeks, till the middle of May, that there may be a succession of crops.

In the management of these latter crops of Beans, the principal care should be to keep them clear from weeds, and other plants, which would hurt them greatly; to keep earthing them up, and when they are in blossom, to pinch off their tops, which, if suffered to grow, will draw the nourishment from the lower blossoms, and prevent the pods from setting, and thus the upper part of the stems only will be fruitful. Always make choice of moist, strong land, for the latter crops; for if they are planted on dry ground, they seldom come to much, unless the summer proves wet.

Kidney BEAN, *Phaseolus*, a genus of plants, ranged by Linnæus among the *diadelphia decandria*, and of which there are six species, divided into a number of varieties: 1. Kidney-Bean, with a twining stalk, and flowers growing in loose spikes, whose wings are as long as the standard. 2. Kidney-Bean, with a twining stalk, whose standard and keel are spirally twisted. 3. Kidney-Bean, with a twining stalk, a spreading standard, which is twisted backward, and narrow, close pods. 4. Kidney-Bean, with a twining stalk, foot-stalks ending in flowers, growing in heads, and four cornered, cylindrical, dust-coloured seeds. 5. Kidney-Bean, with a twining stalk, branching flowers growing by pairs, bractææ, which are shorter than the empalent, and hanging pods; commonly called the Scarlet-Bean. 6. Kidney-Bean, with a twining stalk, flowers growing in long bunches, and short, hairy pods. The first sort grow naturally in Carolina; it is an annual plant. The stalks, like the common Kidney-Bean, twines about any support; they are hairy, and rise to the height of four or five feet; the leaves, in shape, resemble those of the common Kidney-Bean, but are narrower. The flowers are produced in loose spikes, standing upon long footstalks; they are

large, of a purple colour, turning to blue before they fade.

About the latter end of April, sow the seeds on a warm border, keep it clear from weeds, and when the plants begin to run, they must be supported with sticks, to prevent their trailing on the ground. If they are close to a wall, exposed to a good aspect, they will ripen their seeds in England.

The second sort is a native of the Brazils. This is a perennial root, with twining stalks, which rise to the height of twelve or fourteen feet. The leaves are smaller, but in shape resemble those of the common Kidney-Bean. The flowers are of a purple colour, and have an agreeable odour. It is propagated by seeds, which in the spring should be sown on a moderate hot-bed. When the plants appear, fill some pots with light earth, and carefully transplant them into the pots, set them up to the rim in a hot-bed, to facilitate their taking root; after which, inure them by degrees to the open air, into which they may be removed the beginning of July. As they advance in their growth, they should be transplanted into larger pots, which must be filled up with fresh, light earth.

Variety only gives the third sort a place in our gardens, for it boasts no beauty; it is a native of America, and may be propagated in the same manner as the former sort.

The fourth sort comes from America; this should be managed, as directed for the second and third species, with this difference only, that it requires the heat of the stove, to preserve it through our winters.

The fifth sort is cultivated in our gardens chiefly for the beauty of its flowers, they are larger than those of the common Kidney-Bean, and their colour is an elegant deep scarlet. It requires no other care in the cultivation than is bestowed on the common sort: only observe to fix tall stakes by them, to twine round: for they will often rise to the height of twelve or thirteen feet.

The fifth sort is only to be valued for the variety of its seeds, which are half scarlet, and half black; these are easily procured from America. It is therefore, not worth the gardeners while to cultivate it here.

The three sorts which are usually cultivated for early crops, are the liver-colour Bean, the small white dwarf, and the dwarf black; these may be planted much nearer together than the larger growing kinds, the stalks are never very long, and require but little support; these should be planted on hot-beds, under frames, for an early crop in the spring.

The Battersea and Canterbury Kidney-Beans are the next; these bear plentifully for some time, the former is the forwarder of the two, but the latter continues to bear much the longest. The sorts to be preferred for the table, are the scarlet-blossomed Bean, already mentioned; a white Bean of the same shape and size with the scarlet, differing in no other manner from that species, than by colour; and the large Dutch Kidney-Bean, which grows as high as either of the former, and if they are not supported by stakes, their stalks will trail upon the ground, and be inevitably spoiled.

Kidney-Beans, of all kinds, are propagated by seeds, these should not be sown till the middle of April, for cold, wet weather, would rot the seeds; or if the plants appear, they are liable to be destroyed by sharp frosts.

The best way to have early Kidney-Beans, where there is not the convenience of a frame, is this: the beginning of April sow the seeds upon a moderate hot-bed, arch it over with hoops, and every night, and in bad weather, draw mats over them.

Let them remain in this bed till the leaves appear, then take them up carefully, and plant them in a warm border, under a wall, and, if the season is dry, give them a gentle watering; they may afterwards be managed as if sown at first in the full ground, but by following this method, the gardener will have them at least a fortnight sooner.

The manner of planting crops in the full ground, is as follows: the middle of April draw lines over the bed, which should be in a warm situation, and a dry soil, at

two feet and a half distance, drop the seeds about two inches asunder, then draw the earth over them with the head of a rake, till they are covered about an inch deep. In a week or ten days after sowing, the plants will appear, the earth should be drawn close about their stalks, as they rise up. They will now require no farther care, than to be kept clean from weeds.

When the Beans appear, gather them twice a week, for if they are suffered to hang on too long, they not only grow old, and become of no value, but they weaken the plant.

The first crop will continue a month in good order, and to supply the table afterwards, there should be fresh sowings in May and June, the last of which will continue till the frosts destroy them.

Never gather from the plants which you intend to save seeds from. In autumn, when you find they are ripe, pull up the plants, and spread them afterwards to dry; after which thresh out the seed, and preserve it in a dry place for use.

BEAN Caper, *Zygophyllum*, a genus of plants, ranged by Linnæus among the *decandria monogynia*, and of which there are six species: 1. Bean Caper, with a five-sided, prismatic capsule, or the common Bean Caper. 2. Bean Caper, with the angles of the capsule, compressed and membranous. 3. Bean Caper, with globular depressed capsules. 4. Bean Caper, with oval, acute, pointed capsules. 5. Bean Caper, with cylindrical capsules. 6. Bean Caper, with a prickly stalk.

The first species of these plants is perennial, and a native of Syria; it is propagated by seeds sown in the spring, on a warm border of light earth; after the plants are come up, they must be kept clean from weeds, and thinned where they grow too close; when their stalks decay in autumn, let the surface of the ground be covered with tan, and in frosty weather with straw or pease-haulm. In the spring let the plants be taken up, and planted in a light soil, on a south border, close to a warm wall. The other five species are all natives of Africa, and are propagated either by seeds or cuttings; the seeds should be sown on a moderate hot-bed in the spring.

When the plants are fit to be removed, let them be transplanted, each into a small pot, filled with light earth, and plunged in a hot-bed. Let them be kept shaded from the sun, till they have taken root.

As the season advances, they should be gradually inured to bear the open air, into which they may be removed about the end of May, placing them in a warm situation. In autumn, let them be removed into an airy, dry glass-case. The cuttings should be planted in a bed of light earth, during any of the summer months, covered down close with bell, or hand-glasses, and shaded from the sun till they have taken root, after which, let them be carefully transplanted, each into a small pot, filled with light earth, and should be placed in the shade, till they have taken root, then let them be treated like the seedling plants.

BEAR'S-BREECH, *Acanthus*. See the article *Acanthus*.

BEAR'S-EAR, *Auricula Ursi*. See the article *Auricula*.

BEE-FLOWER, a species of a genus of plants, called *Orchis* and ranged by Linnæus, among the *gynandria diandria*.

The root is composed of two roundish bulbs, white, large, juicy, and of a pleasant, sweetish taste.

The leaves are numerous, oblong, moderately broad, of a fresh green, undivided at the edges, ribbed lengthwise, and pointed; they grow in a various manner, some obliquely, some flat upon the ground, and others rising with the stalk, whose first shoot appears very soon after them.

The stalk is round, upright, and a foot in height, of a green colour, and juicy.

The leaves are few upon it, and they stand irregularly, they are oblong, and ribbed, as those from the root.

The flowers are placed at distances, one above another, and they are in the highest degree conspicuous. They resemble, in form and colouring, the great dark humble Bee so regularly, that one starts at the sight, and cannot, without recollection, imagine that they are real flowers.

The parts are these: the rudiments of the seed-vessel support the flower naked, for there is no cup.

The petals are oblong: they are five in number, three large, and two smaller; and the nectarium, which forms a kind of lip, hangs down; this is the whole flower; there rises with each an oblong, narrow, leafy film; and it is in the nectarium that we see the figure and colouring of the Bee; the petals are purplish, and have each a rib of green.

The top of the nectarium is also of a dusky colour, not without some tinge of purple; the body of it, which hangs down, is rounded, hairy, and very much of the shape and common colour of the body of a humble Bee, dusky and blackish.

The colour is of a different tinct, as seen in various lights, and has a velvety appearance; upon this ground colour there are disposed several streaks of a tawney yellow, which also shew themselves variously, according to the light; and there are some lines of white also, elegantly disposed, principally on the under part, and toward the head, in the upper.

This is the most perfect state of the flower: in this condition we are sure to find it wild, where all things favour; and to this state it may be brought in gardens: neither are we to suppose, because we see the flower smaller, or the colouring otherwise disposed, that the species is distinct.

The filaments are only two: they are fixed to the female part, and are terminated by upright buttons, which are defended by the inner edge of the nectarium.

The rudiment of the fruit, which supports the flower, is twisted, the style is single, and is fixed to the interior edge of the nectarium, and crowned with a small head.

The seed-vessel, which follows every flower, is of an oblong, oval form, obtuse, striated, formed of three valves, and marked with three ribs: the seeds are very minute and brown.

Culture of the BEE-FLOWER.

The plant is wild in all the temperate parts of Europe, but it is no where common; for of millions of the seeds, which the winds scatter, scarce one falls where it can shoot.

It is found principally on the hollow sides of old gravel-pits, where there has been time for a slight covering of grass, and sometimes in the loose earth, near the hedges of woods. In these latter places, the flower is usually small; where there is less moisture, and more sun, it attains the due perfection.

It may be raised on the edges of wildernesses, but it will there be liable to many disadvantages: the true place is a hollow, in a dry spot, well defended, and where the surface may be covered with a slight coat of grass, not in turfs, but scattered.

The method should be this: when the plants are in flower, mark as many of the strongest and best, as are intended to be taken into the garden.

Chuse a place for them that is open to the south-east, and perfectly defended from cold winds; dig out the mould two full spades depth, and bring into the place as much of the soil in which the plant is growing, as will fill up the room of it.

Let this be taken, not only from the gravel-pit, but from the same side of the pit, and as near the plant, as may be done with safety, from disturbing their roots.

Let this lie a month to settle: by that time the stalk and leaves of the plant will be in a withered state.

The gardener must watch his time when they are just faded, and then take them up by the roots.

In this there must be a great deal of care used.

He is not to suppose he takes up all the root of an *Orchis*, who gets the double bulb: the fibres run to a great depth, and spread a great way; and unless these

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these are brought up entire, and delivered uninjured to the new soil, there is no hope of succeeding.

The method must be this, a cool evening when the air is damp, must be chosen for the purpose: the gardener must dig round at the distance of a foot, every way from the stem, and he must clear the soil away full two spades depth.

A hole of equal diameter must be opened in the bed, and the whole ball must be taken up with the root undisturbed in it, and let into the hole unbroken; the earth must be filled in to close up the space, and a gentle watering must be given in that place, not near the root.

Then some hay-seed must be scattered upon the surface, and all left to nature; the grass must be suffered to grow moderately, and the plant will rise as naturally among it as in the original pit.

A little grass seed must then be scattered over the intermediate spaces of the border, between the first root, and the others removed in the same manner, and when the grass appears it must be thinned. No part of the bed must be left naked, nor must it any where grow too close. The original root will flower; the seeds will ripen, and all must then be left to nature. They will fall among the grass, and over the border, and some will strike and produce new plants.

This is the method when the plants grow wild near the garden; but from greater distances it must be brought without such incumbrance. Such a bed should be prepared: the roots should be taken up in the same manner when the leaves and the stalks are faded; and wrapped up in some damp moss. When they come to the place they must be planted immediately at four inches depth, and the mould closed over them without pressing it down.

The seeds should also in this case be preserved from the wild plants and scattered over the ground: this will give a fair chance for some plants; the other is a certainty.

BEECH Tree, *Fagus*, a genus of plants ranged by Linnæus, among the *monoecia polyandria*, and of which there are three species; 1. Beech tree with oval sawed leaves, or the common Beech tree. 2. Beech tree with spear-shaped leaves, sharply sawed, and naked on their undersides. 3. Beech tree, with oval, spear-shaped leaves, sharply sawed, and woolly on their underside.

This tree is propagated by sawing the mast; the season for which is any time from October to February, only observing to secure the seeds from vermin when early sowed; which if carefully done, the sooner they are sown the better, after they are full ripe: a small spot of ground will be sufficient for raising a great number of trees from seed, for if the plants come up very thick, the strongest of them should be drawn out the autumn following, that those left may have room to grow; so that a seed-bed carefully managed will afford a three years draught of young plants, which should be planted in a nursery; and, if designed for timber trees, at three feet distance, row from row, and eighteen inches asunder in the rows.

But if they are designed for hedges (to which the tree is very well adapted) the distance need not be so great; two feet from each row, and one foot in the row will be sufficient. In this nursery they may remain two or three years, observing to dig up the ground between the roots once a year, that their roots may the better extend themselves each way: but be careful not to cut or bruise their roots; and never dig the ground in summer, when the earth is hot and dry, which, by setting in the rays of the sun to the root, is often the destruction of young trees.

This tree will grow to a considerable stature, though the soil be strong and barren, as also upon the declivity of hills, and chalky mountains, where they will resist the winds better than most other trees; but then the nurseries for the young plants ought to be made upon the same soil, for if they are raised in good ground and a warm exposure, and afterwards transplanted into a bleak barren situation, they seldom thrive; therefore the best

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method is to have the nursery made upon the same soil where the plantation is intended, and to annually draw out plants to extend the plantation.

It delights in a chalky or stony ground where it generally grows very fast.

BEET beta, a genus of plants ranged by Linnæus among the *pentandria digynia*, and of which there is but one species, though several varieties.

This is a biennial plant. It grows naturally in many parts of England and Holland near the sea coast, and is propagated by sowing the seeds in march on a deep light soil. When the plants have put out four leaves they should be hoed out to the distance of four or five inches, and carefully cleared of weeds; in three or four weeks after this, the ground should be hoed over again, the weeds cut up, and the plants thinned to a greater distance: and in a month afterwards, the ground should be hoed a third time, and the plants thinned to the distance of a foot or more. Transplant some of the finest to a sheltered spot of ground, where they may be defended from high winds, which, if they are not well supported, will break down their stalks, especially when the seeds are formed and become heavy. These will be perfectly ripe the latter end of September, when the stalks should be cut off, dried and threshed out, and the seeds cleaned and put up for use.

BELL-FLOWER, *Campanula*. See **CAMPANULA**.

BEIDAL-OSSAR, a species of *Asclepias*. See **ASCLEPIAS**.

BERBERRY-TREE or *Pipperridge bush*, a genus of plants ranged by Linnæus among the *hexandria monogynia*, and of which there are only two species. 1. Berberry with branching foot Stalks, or the common Berberry bush. Berberry with a single flower on each foot stalk.

These are shrubby plants: the first species grows wild in many parts of England, and most other countries in Europe, and is generally propagated by suckers, which are put out in great plenty from the root; but the method of propagating it by layers is the best: the branches should be laid down in the autumn, when their leaves begin to fall, and the young shoots of the same year are the most proper for this purpose. The following autumn they may be taken off the old plant, and planted where they are designed to remain. When this Shrub is cultivated for its fruit, it should be planted single, the suckers taken away every autumn, and all the gross shoots pruned out. The second species is a native of Crete, and may be propagated in the same manner as was directed for the first; but the branches should be planted in pots, and sheltered under a frame in the winter. When they have obtained strength they may be turned out out of the pots, and planted in a warm situation.

BERRY, *bacca*, a fruit containing a number of seeds in the midst of a succulent pulp.

BETONY, a genus of plants ranged by Linnæus under the *didynamia gymnospermia*, and of which there are four species. 1. Betony with an interrupted spike, and the middle segment of the lower lip of the flowers indented at the end. 2. Betony with whole spike and the middle segment of the lower lip of the flower entire, or Oriental Betony. 3. Betony with a spike leafy at the base. 4. Betony with flowers growing in whorls round the stalks, and prickly flower-cups. Among these species the Oriental Betony only is generally cultivated.

It is a plant which curiosity more than beauty has brought from distant climates into our gardens. But as it requires little trouble in the culture, it is well worthy its place among the rest. The root is composed of numerous large fibres connected to a large head. The leaves rise in great number, and have large footstalks; they are long and narrow, largest at the base, smaller all the way to the point; deeply indented at the edges, and of a light green. The stalks are square, thick, very robust, and a foot and a half high; of a pale green and a little hairy. The leaves on these are placed in pairs, and at considerable distances: they also have foot stalks, and are like those from the root, long, narrow, and notched at the edges, sharp pointed, and of a pale green.

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A large spike of flowers terminates each stalk, and others stand in the bosoms of the leaves: they are small, but in the clusters very conspicuous; labiated from, and of a delicate red with a purplish tinct.

The cup is formed of one piece; tubular, divided into five long, small, and sharp points, and aristated. The flower is formed of a single petal, tubular at the base, and bent; and at the top divided into two lips. The upper lip is obtuse, erect, plain, and undivided. The lower is cut into three segments, and the middle one of these is entire; this is singular to the species of *Betony* here described; in all the others there is a nick at its end.

In the Body of the flower are placed four filaments, two longer and two shorter, with roundish buttons; and amidst these a simple style split into two parts at the head. The seeds follow naked, the cup serving as their defence, and they are four in number.

Culture of this BETONY.

It is a native of the East, but bears our winters in the open air. It loves a deep soil; and no compost suits it better than a common garden mould. As it is a perennial, fibrous, rooted plant, it may be easily propagated by the roots in autumn, but the best method is to raise it from seed. This ripens well with us, and the plants thus obtained, are always the handsomest, and most regular in their growth.

The method is this. Save seeds from a strong and hearty plant, and when they have been well dried, and carefully preserved through winter, sow them in the beginning of April upon a piece of common ground in the nursery. When the plants are grown strong enough to remove, take up as many of them as are intended to be raised, and plant them at a foot distance, in a border of rich mould, there let them stand all the remainder of the summer, and through the winter: the next year they will flower. In autumn they should be taken up, and planted afresh in a new quantity of mould, and thus they will continue in beauty many years; but the best method is to raise a new stock frequently from seed; for the plant never is so perfect as the first year of its flowering.

BEURERIA, a genus of plants ranged by Linnæus among the *icosandria polygamia*, and of which there is no English name. Singularity, fragrance, and beauty, all conspire to render this one of the finest shrubs with which America has enriched our gardens.

It is a tall shrub of irregular growth, very handsome in its natural wild form, and capable at the gardener's pleasure of being trained up to a regular tree. The root is large and spreading; the stem is firm and rough; the branches are numerous, and spread irregularly, and their bark is a pale brown. The leaves are broad and oval, except that they grow small at the base, and of a fresh but not deep green; undivided at the edges, sharp pointed, and lightly ribbed: they stand in pairs and dispose themselves in all directions.

The flowers are large, elegant, and of a deep but very dusky purple; composed of numerous petals waved, and irregularly disposed about a multitude of heads; they have a faint singular smell. The bark has an aromatic scent, in a much higher degree.

Culture of the BEURERIA.

Though it is a native of the warmer parts of America, with proper care it will live through the year in the open air of our climate. We must imitate nature, who generally allows it a deep soil and a defended situation. The gardener must chuse a very rich piece of ground in a warm quarter of the garden, and by digging in a good quantity of pond mud and some old cow-dung, he will mend the quality of the soil without heating it. The best method of propagating it is by layers: cuttings are very precarious; and it never ripens seeds in England, nor have we ever seen the mature fruit from abroad. Put a quantity of rich garden mould into a long rough box, this must be raised on a tressel to such a height, that the branch intended to be laid, can be brought down to it without much force. Then make an opening along the mould in the box, and bring a young branch of the shrub gently down to it. Let some holes be pierced through

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the stalks about the insertions of the leaves, and a piece of brass wire be twisted round it tight just above. In this state lay it in the opening, fasten it down by pegs, and covering it with the mould, give it a moderate watering, and let this be repeated as often as the mould requires it. There is a great advantage in using a large box of mould on this occasion, for it continues much longer and better in a growing condition than a small quantity; and there is danger in frequent waterings of chilling the new roots. The layer should remain a twelvemonth in this condition, and it may then be removed and planted in a warm situation with the same good soil. It will flower the third or fourth year, and from that time constantly, and in vast profusion.

BIGNONIA, the *Trumpet-flower*, or *Scarlet Jesmine*, a genus of plants which Linnæus places among the *didynamia angiospermia*, and of which there are thirteen species. 1. *Bignonia* with single heart-shaped leaves, an erect stalk and flowers with two stamina, commonly called *Catalpa*. 2. *Bignonia* with single spear-shaped leaves, and a twining stalk, or the ever-green *Bignonia*. 3. *Bignonia* with jointed leaves and tendrils, with oval spear-shaped lobes, two flowers upon footstalks and narrow pods. 4. *Bignonia* with jointed leaves and tendrils, with oval heart-shaped lobes, and flowers in branching panicles. 5. *Bignonia* with jointed leaves and tendrils, heart-shaped lobes, and the lower leaves trifoliate. 6. *Bignonia* with jointed leaves and tendrils, heart-shaped lobes, and the lower leaves single. 7. *Bignonia* with finger-shaped entire leaves. 8. *Bignonia* with finger-shaped pinnatifid leaves. 9. *Bignonia* with pinnated leaves, cut lobes, and roots coming out at their joints, commonly called *Trumpet-flower*. 10. *Bignonia* with decomposed leaves, cut lobes, and tendrils coming out at their joints. 11. *Bignonia* with leaves doubly winged, and entire, heart-shaped, acute lobes. 12. *Bignonia* with leaves doubly winged, and spear-shaped entire lobes, commonly called *bastard Guaiacum*. 13. *Bignonia* with conjugate-leaves, short tendrils, and divided into three parts, called *quadrifoliate Bignonia*.

Of these species we shall describe the first and the last only, as their culture will be a sufficient direction for the rest.

Catalpa Bignonia, this is a tree near twenty feet high, which grows naturally in Japan and Carolina, and is propagated either by seeds or cuttings.

The seed for the culture of this *Bignonia*, as they do not ripen in our climate, must always be procured from Carolina. Sow them in middle-sized pots, then set them up to the rim in a moderate hot-bed, and when the plants appear, give them a little air; encrease this gradually, till by degrees you inure them to the open air; in June place them abroad in a sheltered situation. Here they may remain till autumn, then put them under a common frame, allowing them air in mild weather. The spring following let the plants be taken out of the pots, and planted in a nursery bed in a warm situation, let them stand about two years, and then remove them to the places where they are designed to remain.

The cuttings should be planted in pots, in the spring, before the trees begin to push their shoots, and plunged into a moderate hot-bed; refresh them frequently with gentle waterings, and shade them in the middle of the day. When they have taken root, inure them by degrees to the open air, and then let them be treated like other seedling plants.

Quadrifoliate Bignonia. This noble plant is a native of the American islands, and, with very moderate care, will acquire in our gardens an equal perfection to what it shews in those places. The root is long, thick, and black on the outside, furnished with many fibres, and of a disagreeable bitter taste. The stalk is very long, weak, and unable to support itself; nature has therefore given it tendrils wherewith to climb, formed in a peculiar manner for laying hold of every thing that comes in its reach; they are long, slender, and curled, divided into three parts, and these again often subdivided into portions scarce thicker than hairs. The colour of the stalks is reddish, they are smooth and tough, and naturally

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naturally wind about any thing which is able to support them, by this method, and the assistance of their tendrils, they keep themselves up to a vast height.

The leaves are oblong, broad, and not unlike those of the Laurel, but they have a kind of appendage or ear at the base. They rise in a regular manner four from each joint; and they are supported on a divided footstalk, of an inch long, from the center of which division rises the three parted tendril. Their colour is an elegant green, paler on the under than on the upper side, and ribbed with purplish veins.

The flowers are large and elegant, they rise from the same part with the leaves, usually two from each joint; and in the full blow they thus cover the plant and afford a very grand appearance. They are two inches in length and their colour is a rich orange scarlet.

Culture of the Quadrifoliate BIGNONIA.

Where this plant is native it is always found in a deep rich soil; for its reception here, rich garden mould is better than any compost which can be prepared. Though it will live through our winters in a warm situation when it has acquired some strength, the young plants are tender. It will therefore be proper to raise them in a hot-bed, and by degrees inure them to the air.

Good seeds must be procured from the West Indies; and early in spring let them be sown upon a hot-bed, among other tender annual plants, they will require the same care with the rest, and no other.

When they have had their repeated removals with the others, they must be transplanted into an open border, against a wall, exposed to the south sun, and defended from cold winds; here they will grow very fast, and will flower the second year. After this, they will only require pruning in spring, taking out dead stalks, and ill growing branches, to keep them in order: their tendrils will fasten them to the wall, and they will every year, early in summer, cover it to a vast extent with their noble flowers.

After this, they may be increased by laying the branches which root freely, and after one year will be fit for removing into those parts of the garden they are intended to adorn.

BILBERRY, *Vaccinium*, a genus of plants, ranged by Linnæus among the *pentandria monogynia*, and of which there are twelve species; but none of them cultivated in gardens. Two of the species grow wild in moory ground, in several parts of England; and the rest in boggy tracts in the colder parts of Europe.

BINDWEED, *Convolvulus*, a genus of plants ranged by Linnæus among the *pentandria monogynia*; and of which there are thirty-one species, several of which are common weeds, and others too tender to be propagated in this country.

We however raise here various kinds of Bindweeds for the decoration of our gardens, and there is not one of them without its beauty; but the velvet Bindweed excels all by its vast growth, and its perpetual verdure; and the method of cultivating this plant, will be a sufficient direction for the rest.

The root is thick, divided, furnished with many fibres, and spreading. The stalk is round, hairy, and naturally purple: it rises, where it can climb, to the height of twenty feet, and covers its support with innumerable leaves and branches, the leaves are placed alternately, and they are of a distinguished elegance. They have long reddish footstalks, and their shape is heart-like: they are broad and lightly indented at the base; waved at the edges; and sharp pointed.

They are of a pale but not unpleasing green, thick, covered with a greyish, silvery down. This gives them a hoary aspect, very pleasing to the eye; and to the touch a softness equal to velvet. They appear various according to their age; for the plant is covered with them at all seasons. Towards the bottom they are often red, as they decay; and on the rest of the plant a part of them are softer and paler; these are the younger ones; and a part of long standing, duskier in their colour, and to the touch more harsh. On these last the ribs and veins are most conspicuous, and they are often purplish. The flowers are large, and where the plant is well established, very numerous. Some stand singly, others five, six,

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or more together; and their colour is a snowy white, more or less tinged with red. Their form is broad and spread out like a bell. Each is formed of a single petal, expanding from the base into the wide rim, and folded in various places. It stands in a small cup, divided into five light segments; and in its centre rise also five short filaments, crowned with oval, flatted buttons. The style is placed single among these, but is split at the top; and the seeds are contained in a divided capsule.

It is a native of the Canary Islands; but it will live and flower, with moderate care, in our climate. There it delights in woody places, and ascends, as Ivy, the tallest trees: with us it must be supported by poles properly planted.

Culture of the Velvet BINDWOOD.

It is a green-house plant, free to the air in summer, and only requiring shelter against frosts; and it may be raised from seed, or propagated by laying the branches. The former method raises the finest plants when the seeds can be obtained in their perfection: but the other furnishes very good ones, and they will sooner come to flower. If the seeds are preferred, they must be had fresh, and the plants raised in a hot-bed. In the other method little time is lost, for the branches take root easily. They must be laid in March, covered four inches with earth, and assisted in rooting by frequent waterings. In the September following they must be taken from the mother-plant. Each of these must have a large pot. The soil that our experience has shewn best to suit them is this: mix three barrows of light pasture, with two of wood-pile earth, and one bushel of sheep's-dung. Time mellows and prepares these mixtures; and as there is always notice of their being wanted, the advantage should be taken. Let the gardener at the same time he lays the branches of this plant, pile up in an open place this mixture. He must once in a month break and turn it, to destroy weeds and open it to the rains and dews; and by that time his layers are fit to be removed, it will be well mellowed, and fit for their reception. In the centre of each pot must be set a pole seven feet in length, and taper to the top; and the great care will be to secure this firmly. Then plant a layer in the pot: so placing it that the rooted part lie free, and be very well covered, and the shoot rise near the pole.

Let the pot be filled within an inch with this soil, and the young shoot tied up to it with a piece of green worsted. Then give it a gentle watering and place it in the shade, defending it continually from the sun, and frequently repeating the watering till it has taken very good root. After this place it among the green-house shrubs for the short remainder of the season they are to stand out; and afterwards remove it under shelter with them.

Nothing more than the common care will after this be necessary: it will make its own way up the pole; and when it can rise no higher will send out the more branches. A year from the planting it out, it will flower, and continue to do so abundantly.

This is the advantage of the layers over the seedlings; for they sometimes do not come to flower before the fourth or fifth year.

BIRCH-TREE, *Betula*, a genus of plants, ranged by Linnæus among the *monocia tetrandria*, and of which there are four species.

1. The common Birch-tree. 2. Dwarf Birch, with roundish leaves. 3. Birch-tree, with oblong, pointed, heart-shaped sawed leaves. 4. Black Virginia Birch-tree.

The first is the common Birch-tree, which is so well known, as to need no description; this is not much esteemed for its wood, but however, it may be cultivated to advantage upon barren land, where better trees will not thrive; for there is hardly any ground so bad but this tree will thrive in it; for it will grow in moist, springy land, in dry gravel, or sand, where there is little surface: so that upon ground that produced nothing but moss, these trees have succeeded so well, as to be fit to cut, in ten years after planting, when they have been sold for near ten pound per acre standing, and the after produce has been considerably increased. And as many of the woods near London, which were chiefly stocked with these trees, have been of late years grubbed up, so

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the value of these plantations have advanced in proportion: therefore those persons who are possessed of such poor land, cannot employ it better, than by planting it with these trees, especially as the expence of doing it is not great.

The best method of cultivating this tree, is to furnish yourself with young plants from the woods, where they naturally grow, and are generally found there in great plenty; but in places where there are no young plants to be procured near, they may be raised from seeds, which should be carefully gathered in the autumn, as soon as the scales under which they are lodged begin to open, otherwise they will soon fall out, and be lost: the seeds are small, so should not be buried deep in the ground. The autumn is the best season to sow them, and in a shady situation, the plants will thrive better when they are not exposed to the full sun; for in all places where there are any large trees, their seeds fall, and the plants come up well without care: so that if the young plants are not destroyed by cattle, there is generally plenty of them in all the woods, where there are any of these trees: these wild plants should be carefully taken up not to injure their roots. The ground where they are to be planted, will require no preparation; all that is necessary to be done, is to loosen the ground with a spade, or mattock, in the places where the plants are to stand, making holes to receive the roots, covering them again, when the plants are placed, closing the earth hard to their roots. If the plants are young, and have not much top, they will require no pruning; but where they have bushy heads, they should be shortened, to prevent their being shaken and displaced by the wind. When the plants have taken root, they will require no other care, but to cut down the great weeds, which would overhang the plants, being careful not to cut or injure the young trees. This need not be repeated oftner than twice in a summer the two first years, after which time the plants will be strong enough to keep down the weeds, or at least be out of danger from them.

The second sort grows naturally in the northern parts of Europe, and upon the Alps: this seldom rises above two or three feet high, having slender branches, garnished with round leaves, but seldom produces either male or female flowers here. It is preserved in some curious gardens, for the sake of variety, but is a plant of no use.

The third and fourth sorts grow naturally in North America. In Canada these trees grow to a large size, where the third sort is called Merisier.

The natives of that country make canoes of the bark of these trees, which are very light, and of long duration.

Both these sorts may be propagated by seeds, in the same manner as the first, and are equally hardy.

BIRD'S-EYE, a species of the Primrose. See the article **PRIMROSE**.

BIRTHWORT, *Aristolochia*, a genus of plants, ranged by Linnæus among the *gynandria hexandria*, and of which there are thirteen species.

1. Birthwort, with leaves divided into two lobes. 2. Birthwort, with leaves divided into three lobes. 3. Birthwort, with peltated, kidney-shaped leaves. 4. Birthwort, with long, heart-shaped leaves, and an erect, shrubby stalk. 5. Birthwort, with oblong, heart-shaped leaves, a twining stalk, and many flowers on each foot-stalk. 6. Birthwort, with heart-shaped, pointed leaves, a twining stalk, and single flower stalks, longer than those of the leaves. 7. Hairy Birthwort, with hanging, recurved flowers, growing singly, and formed like a lip. 8. Birthwort, with heart-shaped, oblong, waved leaves, a weak stalk, and flowers growing singly. 9. Birthwort, with heart-shaped, oblong, plain leaves, weak, flexible, taper stalks, and single flowers. 10. Birthwort, with heart-shaped, indented leaves, growing upon foot-stalks, and single flowers, called pistolochia. 11. Birthwort, with heart-shaped, sessile, obtuse leaves, a weak stalk, and flowers growing singly. 12. Birthwort, with heart-shaped, entire obtuse leaves, a weak

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stalk, and single flowers. 13. Birthwort, with heart-shaped leaves, an erect stalk, and flowers growing in clusters from the sides of the stalks.

Culture of the BIRTHWORTS.

The three first species are natives of South America, and are propagated by seeds, which must be procured from the countries where the plants grow naturally: for they do not ripen here; these should be sown in small pots, filled with light earth, as soon as they arrive. Should this happen in the spring or summer, the pots should be plunged into a moderate hot-bed, and shaded during the heat of the day. If the plants do not appear before autumn, let the pots be plunged into the tan-bed, in the stove. Should the seeds arrive in the autumn, or the winter, the pots should be plunged into the stove tan-bed, where they may remain till March; let them then be removed and plunged into a hot-bed, under frames. When the plants have acquired a sufficient degree of strength, let them be transplanted each into a separate small pot, and plunged into the tan-bed, in the stove, where they must be preserved. The fourth species is a shrubby plant, and a native of North America; it may be propagated either by seeds, or parting the roots. The plants are generally kept in pots, and sheltered during the winter, but will thrive better in the full ground, if they are protected from severe frosts. The fifth sort has a perennial root, is a native of India, and must be treated like the first three species. The sixth is a native of Spain and Crete, And the seventh of the island of Chios. These are all perennial plants, which may be propagated by seeds sown in autumn, in pots filled with light earth, and placed under a frame, to protect the tender plants from frosts. The glasses should however, be taken off at all times, when the weather is mild. As soon as the plants come up, let them be shaded in the heat of the day, and frequently refreshed with water. As the season advances, they should be inured by degrees, to bear the open air; and when the pots are taken out of the bed, let them be placed in an eastern exposure; during the summer they should be constantly weeded, and in dry weather refreshed with water. In the winter the pots must be sheltered, as before; and in March, before the plants begin to shoot, they should be transplanted into separate small pots, filled as before, and set again under the frame, till the beginning of May, when they may be removed into the open air, and treated as in the preceding summer; and in the winter following secured as before. In the spring they may be turned out of the pots, and planted in a warm border, where they must be kept clean from weeds; and in the autumn, when their stalks are decayed, let the ground be covered with old tanners bark, to keep out the frost. The eighth species is also a native of Crete, and has a perennial root, by parting of which it is propagated, as it never ripens seeds in this country. The plants are preserved in pots, placed under a frame in winter, where in mild weather they should have as much free air as possible. The ninth sort is a native of Virginia, has a perennial root, and is propagated by seeds, in the manner directed for the seventh species. The tenth sort is also a perennial plant, growing naturally in France and Spain, and is preserved only in botanic gardens, for the sake of variety. The eleventh and twelfth species are natives of Italy, and are propagated like the seventh sort. The thirteenth species grows naturally in France and Tartary, and will spread by its creeping roots, and succeed in any soil or situation.

BITTER-VETCH, *Orubus*, a genus of plants, ranged by Linnæus among the *diadelphia decandria*, and of which there are eight species.

1. Bitter-vetch, with leaves placed in pairs, close to the stalks, and with indented stipulæ. 2. Bitter-vetch, with oblong, winged leaves, roundish, moon-shaped, indented stipulæ, and a single stalk. 3. Bitter-vetch, with oval, winged, entire leaves, half arrow-pointed stipulæ, and a single stalk. 4. Bitter-vetch, with a branching stalk, and leaves composed of six pair of oblong, oval lobes.

Culture

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Culture of the BITTER-VETCH.

These are ornamental plants, and very hardy, they have perennial roots, by the parting of which they may be propagated. The proper time for doing this, is in autumn; they thrive best in a shady situation, and a loomy soil. They are also propagated by seeds sown in autumn. When the plants come up, they should be kept clean from weeds, and thinned where they grow too close. The next autumn they should be transplanted to the places where they are intended to remain.

BIXA, *Roucou, Anotta, or Arnotta*, a genus of plants, ranged by Linnæus among the *polyandria monogynia*, and of which there is but one known species.

The singularity and beauty of this shrub, renders it worthy the attention of the curious.

It is a native of the hotter parts of America, with us it requires the heat of the stove; and with our greatest care it will rise but to a moderate shrub, though in its own climate it grows much larger. The stem is covered with a pale brown bark; the upper shoots are yellowish, and on the young twigs there is often a light and elegant tinge of purple. The leaves are placed irregularly, and are in nothing conspicuous, except in their elegant and glossy green; they are broad at the base, narrow to the point, and waved along the edges, have moderate foot-stalks, and their ribs are large and yellow, or purplish. The flowers are large, and of a pale, but elegant red, often diversified with stains of white: they grow principally at the extremities of the branches, and have a tuft of purple buttons, supported by long filaments, in the centre.

The fruit is large, and of an oval shape, it is beset with prickles, and full of scarlet seeds; it is surrounded at the bottom by a small cup, which is divided lightly into five segments, and which before covered the base of the flower.

The Culture of the BIXA.

The seeds are easily obtained, and it may be raised from them without difficulty. The first care should be to have them fresh; for after two or three years, they will rarely shoot.

When you have succeeded in this, let a mixture of two parts garden-mould, one part sand, and one part rotten wood, be prepared; and with this let a couple of common pots be two thirds filled. Scatter the seeds upon the surface, cover them an inch deep, and set the pots in a tan-bed. The plants will appear after some time, they must then be refreshed with gentle waterings, and allowed a little air. When they have four or five leaves a-piece, they must be transplanted each into a separate pot of the same soil, and gently watered. These pots should be placed in another tan-bed, with a deeper frame; and as the weather grows warmer, and the plants stronger, they should have more air.

The waterings are to be repeated at times, and the air admitted carefully, till they have attained more strength and bigness: they are then to be removed into the stove, and to take their chance with the other plants. They will not flower before the third year: in the mean time they will be no unpleasing sight; their leaves and shoots being of an elegant and agreeable colour.

BIVALVE, an appellation given to such pods, or capsules, as consist of two valves, inclosing the seed.

BLADDER SENNA. See **COLUTEA**.

BLADDER-NUT. See **BLADDER-NUT**.

BLANCHING, in gardening, an operation performed on certain fallads, roots, &c. as of Celery and Endives, to render them fairer and fitter for the table.

The time for Blanching of Celery, is about the middle of June, when some of the first sowing will be fit to plant out in trenches for this purpose.

These trenches are to be cut by a line, eight or ten inches wide, and about as many deep, into which they put their plants, after having first pruned off the tops and roots. As they grow large, you must earth them up within four or five inches of their tops, and so continue to do at several times, till whitened sufficiently for use, which they will not ordinarily be, till six weeks after earthing them up. With regard to Endive, as soon as it is

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well grown, they tie up some of it to whiten, and continue every fortnight, as long as it lasts, to tie up fresh parcels.

BLIGHTS are often caused by a continued, dry, easterly wind, for several days together, without the intervention of showers, or any morning dew, by which the perspiration in the tender blossoms is stopped, so that in a short time their colour is changed, and they wither and decay; and if there happen a long continuance of the same weather, it equally affects the tender leaves, whose perspiring matter becomes thickened and glutinous, so as closely to adhere to the surface of the leaves, and become a proper nutriment to insects, which are always found preying on the leaves and tender branches of fruit-trees; when this sort of Blight happens, though it be not the insects which are the first cause, the best remedy yet known, is gently to wash and sprinkle over the trees from time to time with fair water; and if the young shoots seem much infected, to wash them with a woollen cloth, so as to clear them, if possible, from this glutinous matter, that their respiration and perspiration may not be obstructed. Add, that broad flat pans, or tubs of water, being placed near the trees, which may receive the vapours exhaled from them, will help to keep their tender parts in a ductile state; but whenever this operation of washing the trees is performed, it should be early in the day, that the moisture may be exhaled before the cold of the night comes on, especially if the nights are frosty; nor should it be done when the sun shines very hot upon the wall, which would be apt to scorch up the tender blossoms. Another cause of Blights in the spring, is the sharp hoary frosts, which are often succeeded by hot-sun-shine in the day-time, which is the most sudden and certain destroyer of fruits known; for the cold of the night starves the tender parts of the blossoms; and the sun rising hot upon the walls before the moisture is dried from the blossoms, which being in small globules, doth collect the rays of the sun, and thereby scorch the tender flowers, and other parts of the plants.

But Blights are frequently no more than an inward weakness, or distemper in trees, whichevidently appears, if we consider how often it happens, that trees against the same wall, exposed to the same aspect, and equally enjoying the advantages of sun and air, with every other circumstance, which might render them equally healthy, are often observed to differ greatly in strength and vigour: and as often do we observe the weak trees to be continually blighted, when the vigorous ones in the same situation escape. This weakness in a tree proceeds either from want of a sufficient supply of nourishment to maintain it in perfect vigour, or from some ill qualities in the soil where it grows, or, perhaps from some bad quality in the stock, or inbred distemper of the bud, or cion, which it had imbibed from its mother-tree, or from mismanagement in the pruning, &c. But there is another sort of Blight, against which it is more difficult to guard fruit-trees, that is, sharp, pinching, frosty mornings, which often happen at the time when the trees are in flower, or while the fruit is very young, and occasions the blossoms, or fruit, to drop off: and sometimes the tender parts of the shoots and leaves are greatly injured thereby. The only method yet found out to prevent this mischief is, by carefully covering the walls either with mats, or canvas, which being fastened so as not to be disturbed with wind, and suffered to remain on during the night, they are to be taken off every day, if the weather permits. Another sort of Blight, which sometimes happens in April, or May, and which is often very destructive to orchards and open plantations, and against which we know of no remedy, is what is called a fire-blast, which in a few hours hath not only destroyed the fruit and leaves, but many times parts of the trees, and sometimes whole ones have been killed by it. This is supposed to be effected by volumes of transparent, flying vapours, which among the many forms they revolve into, may sometimes approach so near a hemisphere, or hemicylinder, either in their upper or lower surface, as thereby to make the beams of the sun converge

verge enough to scorch the plants or trees they fall upon, in proportion to the greater or less convergency of the sun's rays. This more frequently happens in close plantations, where the stagnating vapours from the earth, and the plentiful perspirations from the trees, are pent : they want of a free air to dissipate and dispel them ; than those planted at a greater distance, or surrounded with hills or woods.

BLITE, or Strawberry Blite, *Blitum*, a genus of plants classed by Linnæus among the *monandria digynia*, and of which there are only two species. 1. Blite with spikes terminated by little heads, or the common Strawberry Blite, or Strawberry Spinach. 2. Blite with small heads growing scattered from the sides of the stalks.

Culture of the BLITE.

These are annual plants, the seeds of which may be sown in March or April upon a bed of common earth, in an open situation. The plants will appear in six weeks after, and if they are to remain in the place where they were sown, will require no other care than to be kept clear from weeds, and to be thinned out, allowing six or eight inches between each plant ; if permitted, they will drop their seeds, and the plants will come up the following spring without any further care.

BLOOD-FLOWER, Bloody Lilly, or African Tulip. See the article **AFRICAN TULIP**.

BLUE BOTTLE, *Centaury*. See the article **CENTAURY**.

BLUE DAISY. See the article **DAISY**.

BORBONIA, a genus of plants ranged by Linnæus among the *diadelphia*, or perhaps more properly among the *monadelphia*, and of which there are three species. 1. Borbonia with entire, spear-shaped leaves, with many nerves. 2. Borbonia with heart-shaped, undivided leaves, marked with numerous ribs. 3. Borbonia with entire, spear-shaped leaves, with three veins.

These plants are natives of the Cape of Good Hope, where they attain the height of ten, eleven, and sometimes twelve feet. With us they seldom rise to more than five. The first species has slender stems divided into several branches, decorated with stiff leaves placed alternately, narrow, long, and ending in a sharp point. The flowers are placed in small clusters between the leaves at the end of the branches, these are yellow, and in shape resemble those of the Broom.

The stem of the second species is round, tough, of a greyish colour, and full of broad leaves, they are of a beautiful green with a tinge of blue. The nerves run high upon them, and their point is prickly. From the main stem run many irregular branches, on these stand numerous leaves with thick tufts of intermingled foliage and flowers on their tops : the leaves in these tufts are paler and less regularly shaped than those on the lower part of the plant : the flowers which rise among them exceed them in length, and their colour is a very bright golden yellow.

The stems of the third species are stronger than either of the former ; they are decorated almost their whole length, as are also their branches, with stiff, spear-shaped leaves. The flowers stand at the extremity of the branches each on a separate footstalk. They are of the same shape and colour with the former.

Culture of the BORBONIA.

These plants are raised from seeds, which should be procured from the cape of Good Hope, for they never ripen with us. Make a compost for them after the following method.

A barrow of earth from an upland pasture, a bushel of sand, and a peck of rotted cow-dung. Early in the spring fill a couple of pots, on the surface scatter some of the seeds ; sift over them a quarter of an inch of the same compost, and set them up to the rim in a bark-bed. At times give them a gentle watering ; when the plants rise repeat it oftener, and give them air in the middle of the day. When they have a little strength raise the pots to the surface and give them more air. Soon after this transplant the strongest of them into separate pots of the same compost ; put these into the bark-bed, water-

ing and shading them till rooted. Then by degrees bring them into the open air, among the green-house plants, and in autumn remove them into shelter.

BORDER, in gardening, denotes a narrow bed adjoining to a walk, serving to bound and inclose the parterres, and prevent their being injured by the feet.

The use of borders is to inclose parterres, and ought always to be laid with a rising in the middle by which they will have a better effect to the eye than if quite flat, and their breadth should be between four and six feet. Borders are properly of four sorts ; the first are those which are continued about parterres without interruption, and are wrought with a sharp rising in the middle, and planted with low shrubs and flowers. The second sort of borders are those which are cut into compartments, at convenient distances, by small passages ; these are raised in the middle, and planted as the former with shrubs and flowers. The third sort are such as are laid even and flat without flowers, and have only a verge of grass in the middle, being edged with two small paths, raked smooth and sanded ; these are sometimes adorned with vases of flowers, of large growth, or flowering shrubs, along the middle verge of grass. The fourth sort are quite plain, and are only sanded, as in the parterres of orangeries ; and are filled with cases ranged in regular order along those borders, which are edged with box on the sides next the walks, and on the other with verges, and grass work next the parterre. Sometimes a Yew is planted between each case, which makes the borders appear richer, and the parterres handsomer, during the winter season. Borders are made either strait, circular, or in cants ; and are turned into knots, scrolls, volutes, and other compartments. The florists make borders in any part of their gardens, which they usually edge with green borders ; and this gives them a very neat look : in large parterres all that is expected, is to stock them well with flowers, that will succeed one another during the summer season.

BORECOLE, a variety of Cabbage. See the article **CABBAGE**.

BOREAGE, a genus of plants ranged by Linnæus among the *pentandria monogynia*, and of which there are four species.

They are plants of no great beauty, therefore seldom cultivated in gardens. They are propagated by sowing their seeds on a warm border.

BOSQUETS, in gardening, a term for groves included in gardens.

These are small compartments in gardens, which are formed of trees, shrubs, and tall flowering plants, set in quarters, and either placed regularly in rows, or disposed in a more irregular manner. These quarters should be surrounded with evergreen hedges, and the entrances made into porticos with Yews. In the inside there must be some walks, either strait or winding ; these if the quarters are large should be eight feet wide, and laid with turf, and kept well mowed and rolled. The hedges of these quarters should be kept low, that the heads of the shrubs may be seen from the outside. There is a great deal of fancy to be employed in the planting these Bosquets, which should be shown in setting to view at once such shrubs as have the most differently shaped, and coloured leaves that may be, as the long, the round, the jagged, and the various shades of deep and light green, and the mealy or hoary white leaves. Besides this, there is also a great variety of beautiful fruits, which give a very elegant and pleasant prospect even after the leaves are fallen. The shrubs which produce these, are, 1. The *Eunonymus*, or Spindle-tree. 2. The *Opulus*, or Water Alder. 3. The Cockspur Hawthorn ; and 4. The Flowering Ash as it is called ; besides an innumerable parcel more. Observe never to mix the evergreen trees with those which lose their leaves in winter. These Bosquets are only fit for large gardens. They are generally laid out into some regular figure, as a circle, square, polygon, or the like, and make a considerable article in the decoration of a fine garden.

BOTANY, the science or knowledge of plants. Authors are divided about the precise object and extent of

of botany, which some will have to include the whole province of plants, in all their states, uses, and relations: others restrain it to the knowledge of the classes, genera, species, external figures and descriptions of plants, exclusive of their virtues, which are left to the consideration of physic and pharmacy; of their origin and generation, which are left to physiology; and of their culture and propagation, which are left to gardening and agriculture.

The term Botany, says a modern writer, has been understood as expressing the doctrine of plants at large, and in all its various lights; but tracing the origin and progress of the study, we see it at several periods under distinct appearances. These however, are all reducible to those general heads, which we may distinguish by the terms philosophic, historical, and systematic Botany. Of these the first and noblest has been the least cultivated; it began, and in a manner ended, with Theophrastus; its object is the nature of vegetables as vegetables, independent of all other considerations; to this succeeded the historical branch, gathering the names and numbers of plants, their places of growth, their virtues, and their oeconomic uses: this was the object of those, who studied herbs, from Theophrastus to the latter end of the sixteenth century, when Cæsalpinus gave origin to the systematic Botany: till this time plants were arranged, even those who wrote best on them, according to the old and irregular division, into trees, shrubs, and herbs; or according to their virtues, the letters of the alphabet, which began with their names, or by such vague and arbitrary methods. Their increased number now made it necessary they should be better arranged: and this great author has struck out that path, which has since been trod so happily, of examining their parts, and deducing thence the characters of classes, arranging in each class all those, which had the peculiar mark which made its distinction. The origin of systematical distribution was the selecting some part of a plant, which was obvious and regular in itself, and establishing a character upon its description, to which all others that had the same mark were referred. Thus were formed the characters of classes first, and then the distinctive mark of the genera. Between these there came naturally some lesser peculiarity, the subdivision of the classes by orders. The original invention was the choice of some one part of the character, and what part that should be was left to discretion. The great inventor chose the seeds, which he arranged according to the situation of the corculum, or heart of the seed, and to its place upon the plant; and upon this basis he founded the first arrangement of plants. Afterwards various parts of plants, and various collections of parts were adopted for the characters of classes. One hundred and three years after Cæsalpinus, Morison a Briton, entered successfully into the same path; Ray followed, Knoutius followed Ray, and Herman followed him. Riverius was cotemporary with Knoutius; these both wrote in the year 1690, and after four years more followed Tournefort, the greatest of them all. Thus closed upon the science the seventeenth century, in the last seventeen years of which the long neglected institution of Cæsalpinus was so well revived, that there appeared no less than six distinct systems of plants and each of very considerable merit. The authors of the four first held the fruits and seed, according to the original practice of Cæsalpinus, to be the properest, at least the most essential parts, on which to found a system. Riverius struck out the design of fixing the characters in the flower, and Tournefort pursued this with the greatest attention, industry, and truth. Boerhaave, who wrote in the beginning of the 18th century continued the system in its original course, making the fruits and seeds of plants his great object in their arrangement. In 1711, Hæcher of Wirtemberg appeared with credit, and led a long train; who less regarding the original object of distinction, followed Riverius and Tournefort in the choice of the flower. Seven years after, Ruppius wrote, adopting the same part as the foundation of his system, and thus continued the established doctrine with Pontedera, Hebenstret, and Hudwig. In the mean time Magnal distinguished himself

by a new system, formed upon the construction of the cup; and in the year 1735 Linnæus, too great for praise, published that system of Botany, which characterizes the classes according to the parts of generation or fructification, the filaments, and style; and takes into the general distinction all the flower.

BOXTHORN, *Lycium*, a genus of plants ranged by Linnæus among the *pentandria monogynia*, and of which there are three species.

1. *Lycium*, with linear leaves. 2. *Lycium*, with spear-shaped, thick leaves, and bifid cups. 3. *Lycium*, with wedge-shaped leaves.

These are shrubby plants. The first species is a native of Africa, and is propagated by seeds or cuttings. The seeds should be sown in autumn, soon after they are ripe; and if they are sown in pots, they should be plunged in some old tan in the winter, and in a very severe frost covered with pease-haulm, or straw. In the spring the pots should be plunged into a moderate hot-bed, which will bring up the plants: as soon as the frosts are over, they should be inured to bear the open air: when they are three inches high, let them be shaken out of the pots, and each planted in a separate pot filled with loamy earth, and placed in the shade, till it has taken new root, after which it may be removed to a sheltered situation where it may remain till autumn; then the plants should be either put into the green-house or placed under a hot-bed frame, to shelter them from hard frost; when they have gathered strength, a few of them may be planted in the full ground in a warm situation where they will live in moderate winters, but in hard frosts they are commonly destroyed. If the cuttings of these plants are planted in a shady border, in July, and duly watered they will take root; after which they may be treated like the seedling plants. The second species is a native of Asia and Africa. The third grows naturally in the south of Europe; both sorts may be propagated in the manner directed in the first species.

BOX-TREE, *Buxus*, a genus of plants ranged by Linnæus among the *monoecia tetandria*, and of which there is but only one species with two or three varieties.

The best method of propagating this tree is by cuttings, which should be planted in autumn in a shady border, and kept watered till they have taken root, in October they may be transplanted into nurseries. It may be also propagated by laying down the branches, or from seeds, which should be sown soon after they are ripe in a shady border.

BRACTEA, a floral leaf, such as is found to accompany the fructification of some plants; and may be distinguished from a calyx, by the calyx always withering when the fruit is ripe, but the Bractea will remain longer. In many plants there are found green leaves among the flowers, that differ in shape from the ordinary leaves of the plant; these are the Bractea or floral leaves, which are commonly situated on the flower-stalks, and sometimes so near the flower, as to be mistaken for its calyx.

BRAMBLE, *Rubus*, a genus of plants, placed by Linnæus among the *icosandria polygynia*, and of which there are ten species, but the following only is cultivated in gardens, except the Raspberry, which will be described under its proper article. See **RASBERRY**.

Bramble, with prickly stems and foot-stalk, with leaves digitated in fives, and in threes, or the Double-blossomed Bramble.

The root is long and spreading, the stem weak, purplish, and drooping, and the foot-stalks are equally beset with thorns. A number of boughs generally rise together, and spread themselves every way: these droop with their own weight, and so full of life is the shrub, that when they find a favourable soil, they will root again at the head, and thence send out new shoots, which, if left to nature, root at their heads again.

Three, or five leaves, adhere to one common foot-stalk, they are oblong, considerably broad, of a deep green on the upper side, and whitish underneath; the

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flowers terminate the stalks and branches, they also rise in numbers from the bosoms of the leaves, are numerous, and very elegant; so many diminutive roses, round full of petals, white, with a delicate blush of crimson, and very regularly formed.

Culture of the Double BRAMBLE.

No great care is necessary to make the rude shrub of a hedge live in good ground; one great advantage attends this plant, that with all its elegance, it will live where other shrubs would come to nothing. As to its propagation, it must be by layers: these will soon take root. One year after laying, they may be taken up, and planted in the places chose for them, they should be watered till the roots have shot the fibres into the new mould, after which nothing can hurt them. Allow them room to spread, and observe to take off their suckers in autumn, or they will hurt the original plants.

BRANCH, the division of a stalk, in trees it is called a bough.

BROCOLI, an Italian name for a species of the Cabbage, or *Brassica*, of which there are two sorts, the white, and the purple, or green.

Culture of the BROCOLI.

About the middle of May sow the seeds of the Brocoli in a loose moist soil; if the weather proves dry, the bed must be well watered; when the young plants have put out about eight leaves each, they must be transplanted: set them at three inches distance, and let them remain till the middle of July; when taking, if possible, the advantage of moist weather, they may be planted out in rows, where they are to remain; allow the distance of three feet between each row, and plant them two feet from each other; give them a gentle watering as soon as they are planted, and if the weather should prove dry, repeat the waterings once in two or three days, till the plants have all taken root. The soil in which they are to be planted, ought to be rich, and rather light than otherwise.

Towards the end of December, if the weather is not severe, they will begin to shew their heads, which, especially at their first appearance, are not unlike Cauliflowers. When the heads divide, and begin to run up, they must be cut, with four or five inches of the stem to them; in about a month a great number of sprouts, or side-shoots, produced from the same stalk, will succeed them; these will continue fit for eating till April, and though they are not so large as the former, they are equal, if not superior in flavour.

In order to save good seeds of Brocoli, a few of the largest heads should be reserved; observe to strip off the side-shoots, leaving only the principal head to flower, and be particularly cautious not to let any other plant of the same genus be near them at the time they are in flower, as the mixing of the farina will occasion a degeneracy. If this practise is duly observed, the seeds may be preserved in perfection many years.

There is a third sort of Brocoli, called the brown, or black Brocoli, but it is much inferior in flavour to the former, all that can be said in its favour, is, that being a hardier sort, it will bear the severity of the winter better, and is on that account a good substitute, when the other sorts have failed.

This sort grows very tall, the earth should therefore be drawn up to their stems as they advance in height; this does not form heads so perfect as the Italian Brocoli, the stems and hearts of the plants, being the parts which are eaten.

BROOM, *Genista*, a genus of plants, ranged by Linnæus among the *decandria diadelfia*, and of which there are nine species; 1. Broom, with trifoliate leaves, usually called Canary Cytisus. 2. Broom, with jointed branches, looking both ways, and oval, spear-shaped leaves, or Dutch Arrow Broom. 3. Broom, with three cornered, jointed branches, and leaves ending in three points, or shrubby Portugal Dyers Broom. 4. Broom, with spear-shaped leaves, and taper, striated, erect branches, or common Dyers Broom, or Wood-Waxen. 5. Broom, with obtuse, spear-shaped leaves, and a declining stalk, with tubercles. 6. Broom, with single spines, flower branches without spines, and spear-shaped

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leaves, or small English Broom, called Petty Whin. 7. Broom, with compound spines, flower branches not prickly, and spear shaped leaves. 8. Broom, with decompounded spines, flower branches without spines, and narrow, hairy leaves. 9. Broom, with a stalk without leaves, and decussated spines.

Culture of the BROOM.

The first and last species are natives of Spain, Portugal, and the Canaries, they thrive best in a light soil, that is not too rich. They will grow very well from layers, but the most elegant shrubs are to be raised from seeds, and this requires little trouble; let some well-ripened seeds be saved in autumn, and the following spring sown on a moderate hot-bed; when they come up, thin them a little, water them carefully, and when they are three inches high, let them be planted separately, in pots of fresh pasture-earth: let these be set up to the rim in a bark-bed, where the heat is but moderate, and carefully watered, covering the glasses with mats, against the full power of the sun.

By degrees let them be hardened, and towards the end of July bring them out into the open air. In October remove them into the green-house, and throughout the winter let them have a good deal of water, and as much air as can be admitted. When they are considerably increased in size, they must be removed into larger pots, set them out in summer, and house them in winter: thus they will flower most part of the year.

The rest of these species are natives of different parts of Europe, and are hardy plants, which will grow in almost any soil or situation.

BRYONY, *Bryonia*, a genus of plants, ranged by Linnæus among the *monoecia syngenesia*, and of which there are six species.

1. Bryonia, with palmated leaves, rough, and callous on both sides. 2. Bryonia, with smooth, palmated leaves, cut into five spear-shaped, spreading, sawed segments. 3. Bryonia, with heart-shaped, oblong, five cornered, indented, rough leaves. 4. Bryonia, with palmated, rough leaves, smooth on both sides, and winged segments. 5. Bryonia with palmated leaves, smooth on both sides, and winged segments. 6. Bryonia, with palmated leaves, callous, and spotted on the upper side.

The first species is a perennial plant, which grows naturally in the hedges throughout Europe, and may be propagated by sowing the berries upon a dry poor soil in the spring. The second and fourth species are natives of Ceylon, and the fifth of Africa: These are also perennial plants, and may be propagated by parting the roots, and planting them separately in pots filled with light fresh earth, and in the winter placed in a green-house, to be protected from the frost. The third species grows naturally in the island of Ceylon; and the sixth in Crete: these are annual plants, and are propagated by sowing the berries early in the spring on a hot-bed. When the plants will bear it, they should be transplanted each into a small pot, filled with light fresh earth, and plunged into a hot-bed of tanners bark, observing to water and shade the plants till they have taken root; they should afterwards be inured to the open air, where they may remain during the summer; but in winter they must be shaded from the cold.

BUGLOSS, *Anchusa*, a genus of plants ranged by Linnæus among the *pentandria monogynia*; it comprehends the Anchusa, strictly so called, or Alkanet, and the Buglossum or Bugloss; of this genus there are six species. 1. Bugloss with spear-shaped leaves, and imbricated fruitful spikes. 2. Bugloss with conjugated and nearly naked bunches. 3. Bugloss with narrow indented leaves, foot-stalks to the branches, and swelling cups over the seeds. 4. Bugloss with branches and wings growing alternately from the wings of the stalks, and oval branches. 5. Bugloss with flowers growing thinly, and a smooth stalk. 6. Bugloss with two leaves growing in heads upon foot-stalks.

Culture of the BUGLOSS.

They are all perennial plants: the first species is a native of most countries in Europe. The second grows naturally in Italy and Germany. The third in Spain and

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and Portugal. The fourth in the Levant. The fifth in Virginia. The sixth in England, and with the third species in Spain.

The plants are propagated by seeds. In spring, or autumn, sow them upon a bed of light sandy earth, and when the plants are strong enough to be removed, transplant them into borders, allowing two feet distance between each plant. If the season is dry give them gentle waterings till they have taken root, then observe to keep them clear from weeds, which is all the care they require.

BULBS, or *Bulbous Roots*, a name given by botanists to such roots of plants as are nearly round, composed of several skins or coats laid one over another, sending forth from its lower parts a great number of fibres; such are the roots of the common Onion, the Daffodil, the Hyacinth, and those of several other plants. Modern botanists distinguish two kinds of Bulbs, tunicated and squammous; tunicated Bulbs are those composed of several coats or bulbs laid over one another; such are the roots of the Onion, Tulip, and Jonquil; and squammous Bulbs are those composed of several scales laid in like manner over each other; such as the root of the white Lily.

BULBOCODIUM, a genus of plants of which there is no English name, ranged by Linnæus among the *hexandria monogynia*, and of which there are only two species.

1. *Bolbocodium* with spear-shaped leaves, by some authors called Spanish Spring Meadow Saffron. 2. *Bulbocodium* with narrow awl-shaped leaves.

These are perennial plants, the first is a native of Spain, and the second of the mountains of England and Switzerland. They have bulbous roots, and are propagated by off-sets in the manner of other bulbous rooted flowers. They should be removed when their roots decay; and, not oftener than every three years; the first species should have a south border; but the second requires an eastern aspect. They succeed best in a fresh loamy soil, but not dunged. They may be also propagated by seeds, which should be sown in pots filled with fresh loamy earth in September or October. Let the pots be placed under a frame, to protect them from severe frosts; and in the spring when the plants are come up, they should be removed, and placed so as to have the morning sun. In dry weather let them be refreshed with water, while their leaves continue green; but when these decay, the pots should be removed to a shady situation, and there remain till autumn, keeping them clean from weeds. In October let the pots be sheltered as before, and in the following spring they must be treated in the same manner as the former year, till their leaves decay; then the roots should be taken up and transplanted into the borders of the flower-garden.

BUNIAS, a genus of plants ranged by Linnæus among the *tetradynamia filiquosa*, it has no English name. There are four species. 1. *Bunias* with two a horned divaricated pod, prickly at the base. 2. *Bunias* with a four-cornered pod, and the angles doubly crested. 3. *Bunias* with oval gibbous pods, marked with protuberances. 4. *Bunias* with oval smooth pods, standing on each side of the stalk.

The first species is a native of Siberia, the second grows naturally about Montpellier in France, the third in Russia, and the fourth is a native of the maritime parts of Europe, Africa, and America. The first, second and fourth are annual plants, and the third has a perennial root. They may all be propagated by seeds, which should be sown soon after they are ripe, in the places where the plants are designed to remain. When the plants are come up, they should be thinned to the distance of two feet, after which they will require no other care but to be kept clean from weeds.

BURNET, *Potterium*, a genus of plants ranged by Linnæus among the *monœcia polyandria*, and of which there are three species. 1. Unarmed Burnet with angular stalks. 2. Unarmed Burnet, with narrow, taper stalks. 3. Burnet with branching spines.

Culture of BURNET.

The first species grows naturally in many parts of

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England. Its tender leaves are put into sallads, and cool tankards. The second is a native of the southern parts of Europe. Both sorts are perennial plants, and easily propagated by sowing their seeds in autumn.

The third sort is a native of Crete, and is too tender to live through the winter in the open air of our climate, it should therefore be sheltered under a common hot-bed frame; and when the weather is mild admit the free air. It is propagated by slips or cuttings during any of the summer months.

BURNET *Sanguiforba*, a genus of plants classed by Linnæus among the *tetandria monogynia*, and of which there are only two species. 1. Burnet with oval spikes, or the Greater Burnet. 2. Burnet with very long spikes.

Culture of this BURNET.

The first species grows naturally in the meadows in many parts of England. The second is a native of North-America. They have perennial roots, and are very hardy plants; they are propagated by sowing their seeds in autumn. When the plants are come up, they must be kept clear from weeds till they are fit to be transplanted, when they should be removed into a shady border, and planted at the distance of six inches every way; water them gently till they have taken fresh root. In autumn they may be removed to the place where they are designed to remain.

BURNING THORNY PLANT, *Euphorbium*, a genus of plants classed by Linnæus among the *dodecandria trygynia*, and of which there are no less than fifty-six different species, too great a number for a particular description, indeed many of them being common weeds in this country are not worthy of it. Several species are natives of India and other warm countries, and these are often propagated by the curious.

Culture of the BURNING THORNY PLANT.

Some species of these plants are annual, some shrubby, and others perennial. The proper soil for them is a compost made of one half sea-sand, one quarter light fresh earth, and one quarter lime-rubbish. This should be mixed three months before it is wanted for use, and turned very frequently. These plants are propagated by cuttings, which should be taken off from another plant at a joint, and laid in a dry shady place for a week, that the part cut from the old plant may have time to harden; this should be done in June or July; fill some very small pots with the above compost, and set one of the cuttings in each pot, give them a little water to settle their roots. Set them for a day or two where they may have the advantage of the morning sun, then plunge them into a hot-bed of tanners-bark, and shade them in the heat of the day.

These plants being replete with a milky juice, require very little water. In six weeks after planting they will have taken root, and are then to be treated as other succulent plants of the same kind.

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CABBAGE, *Brassica*, a genus of plants ranged by Linnæus among the *tetradynamia filiquosa*, which comprehends Cabbage, strictly so called, or *Brassica*, Turnep or Rapa, Rocket or *Eruca*, Navew or *Nagus*; according to former botanists four distinct genera.

Culture of the CABBAGE.

The several sorts of this plant cultivated in our gardens, are the common white and red Cabbages, the Russian Cabbage, the Battersea and Sugar Loaf Cabbages, the Savoy Cabbage, the Borecole, the Cauliflower, the Brocoli, and a few others. For the two latter see their respective articles.

The common white, red, flat, and long-sided Cabbages, are chiefly for winter use. In the middle of March sow the seeds of these sorts in beds of good fresh earth; in April plant out into shady borders, and about the

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the middle of May transplant them to the places where they are to remain. Water them at times, be careful that the earth is hoed up about their roots, and keep them clear from weeds. These Cabbages will be fit for the table soon after Michaelmas, and, if not destroyed by bad weather, will continue till February.

The gardeners about London, pull up their Cabbages in November, and trenching the ground in ridges lay the Cabbages close as possible on one side against those ridges, burying their stems in the ground; in this manner they let them remain till after Christmas, when they cut them for market. This is a good method of securing them from the effects of bad weather.

The Russian Cabbage is to be raised in the same manner as the above sorts, but not being so large, it may be planted nearer. It is fit for use in July. This Cabbage is now very little cultivated.

The early Battersea and Sugar-loaf Cabbages are sown for summer use, and are commonly called Michaelmas Cabbages. The season for sowing these is the beginning of July, in an open spot of ground. In May and June they begin to turn their leaves for cabbaging, to perfect which they should be tied about the top with an ozier band.

The Savoy Cabbages are for winter use, and must be sown about the beginning of April. Transplant them into an open place, allowing two feet distance between each plant. They are to be treated as the common Cabbage.

The Borecole may be cultivated in the same manner, but must be planted only at one foot distance; these are not fit to cut till the frosts have nipped them.

The method of obtaining good Cabbage-seed is as follows: in October chuse out some fair plants, pull them up, and hang them, with the root upwards, in a shady place, for three days; then plant them under a warm hedge, burying the whole stalk, and half the Cabbage, in the earth. If the winter should prove hard, lay a little straw or pease haulm lightly over them, taking it off as often as the weather proves mild, lest by keeping them too close they should rot. These Cabbages will shoot out strongly in the spring of the year, and divide into a great number of small branches: it is proper therefore, their stems should be supported to prevent their being broke off by the wind; and if the weather should be hot and dry when they are in flower, they should be refreshed with water once a week, sprinkling it all over the branches, which will greatly promote their feeding, and preserve them from mildew. When the pods begin to change brown, the extreme part of every shoot with the pods should be cut off, which will strengthen the seeds greatly. When the seeds begin to ripen, the gardener should be particularly careful, that the birds do not destroy it, for they are very fond of these seeds. The best method to prevent this, is to get a quantity of bird lime, and daub over a parcel of slender twigs; fasten these at each end to stronger sticks, place them near the upper part of the seed, in different places, so that the birds may alight upon them, by which means they will be fastened thereto; where you must let them remain, if they cannot get off themselves; if there should be no more than two birds caught, it will sufficiently terrify the rest, and they will not come to that place again for a considerable time. When the seeds are quite ripe, cut them off, and after drying, thresh them out, and preserve them in bags for use.

In planting of Cabbages for seed, the gardener should be careful to sow only one sort in a place, and by no means plant red and white Cabbages near each other. It is entirely owing to this that there is rarely any good Red Cabbage-seed saved in England, but we are obliged to procure it from abroad, whereas if they would plant Red Cabbages by themselves for seeds, they might continue the kind as good in England as in any other part of the world.

Sea CABBAGE, *Crambe*, a species of the *Brassica*, of which there are five different sorts. 1. Sea Cabbage with smooth stalks and leaves. 2. Sea Cabbage with

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leaves deeply cut, and an upright branching stalk. 3. Sea Cabbage with rough leaves and a smooth stalk. 4. Sea Cabbage with rough stalks and leaves. 5. Sea Cabbage with cut leaves, whose jags are opposite and entire, and smooth stalks and leaves.

Culture of the SEA CABBAGE.

The first of these species sends out many broad leaves, which are jagged and furbelowed on their sides, and of a greyish colour, their flowers are white, and grow in loose spikes. The roots creep under ground, whereby it propagates very fast.

This plant is propagated in gardens by sowing the seed soon after it is ripe, in a sandy or gravelly soil, where it will thrive exceedingly, and, if encouraged, soon overspread a large spot of ground, but the heads will not be fit to cut, until the plants have had one years growth. The beds in which the plants grow, should at Michaelmas be covered over with sand, or gravel, about four or five inches thick, which will allow a proper depth for the shoots to be cut before they appear above ground; which is the method in Sussex, and Dorsetshire, where this plant grows wild in great plenty upon the gravelly shore, where the tide flows over it, and the inhabitants, observing where the gravel is thrust up by the roots of the plant, open the place, and cut the shoots before they come out, and are exposed to the open air. When they are cut so young they are very tender and sweet; but if they are suffered to grow above the ground, they become tough and bitter.

If the beds are gravelled every autumn, the plants will require no other culture.

The other species are only preserved in the gardens of the curious, for the sake of variety, having neither use or beauty to recommend them.

CABBAGE-TREE, a species of the *Palma* or *Palm-tree*. This is a most beautiful tree, and common in several parts of America. It is sometimes called the Royal Palm Tree, from its remarkable height, majestic appearance, and beautiful foliage.

Its roots are innumerable, they are small, but of a great length, and penetrate some yards into the earth, especially where the soil is sandy, or otherwise porous.

The trunk juts, or bulges out a little near the ground, by which means it hath the appearance of a substantial basis, to support its towering height: it is elegantly straight, and scarce can a pillar of the nicest order in architecture be more regular, especially when it is of about thirty years growth; it rises to the height of one hundred and thirty-four feet.

The trunk of this tree, near the earth, is about seven feet in circumference, the whole body growing tapering to the top; the substance of the tree, for about two or three inches deep, within the bark, is of a blackish colour, extremely hard and solid: this surrounds the inner substance, which is a whitish pith, intermixed with some small veins of a more ligneous texture; the colour of the bark much resembles that of an Ash-tree, and is very faintly clouded, at the distance of about four or five inches, with the vestigia of the fallen off branches; this colour of the bark continues till within twenty-five or thirty feet of the extremity of the tree, when it alters at once from an Ash-colour to a beautiful sea-green, and remains of the same colour to the top.

About five feet from the beginning of the green part upwards, the trunk is surrounded with numerous branches in a circular manner: all the lower branches spread horizontally with great regularity, and the extremities of many of the higher ones bend wavily downwards, like plumes of feathers; these branches when full grown, are near twenty feet in length, and are thickly set on the trunk alternately, rising gradually superior one to another: their broad, curved sockets surround the trunk in such a manner, that the sight of it is lost, till it appears again among the uppermost branches, and is there enveloped in an upright, green, conic spire, which beautifully terminates its greatest height.

The branches are somewhat round underneath, and slightly

slightly grooved on the upper side: they are decorated with a great number of pinnated leaves; some of these are near three feet long, and an inch and a half broad, growing narrower towards their points, and gradually decreasing in length at the extremities of the branches; the middle rib, in each leaf, is strong and prominent, supporting it on the under side, the upper appearing smooth and shining; the pithy part of the leaf being scraped off, the inside texture appears to be a number of longitudinal, thread-like filaments; these being spun in the same manner as they do hemp, or flax, are used in making cordage of every kind, as well as fishing-nets, which are esteemed stronger than those usually made from any other material of the like nature.

It is observed that the lowermost branch, for the time being, drops monthly from the tree, carrying with it an exfoliated circular lamen of the green part of the tree, from the setting on of the branches to the Ash-coloured part, which is about five feet in length, and in breadth the circumference of the tree at that part; this, and the branch to which it is always fixed, fall together. When the loss of this lower branch happens, then the green, conic spire, which issues from among the centre of the uppermost branches, and rises superior to all, partially bursts, and thrusts from its side a young branch, which continues the uppermost, till another of the lower branches falls off: then the spire again sends forth another branch superior in height to the last; so that the annual loss of the branches below, is supplied in this surprising manner by those above.

That part of the tree which is of a green colour, differs from the Ash coloured part no less in substance than colour, the former, instead of being extremely hard on the outside, and pithy within, is composed of so many coats, or separate laminæ, of a tough bark-like substance, of near a quarter of an inch thick, and so very closely wrapped together, that they jointly compose and constitute that green part of the tree. As the lowermost, as well as each other higher branch, when they successively grow to be old, is joined by the broad socket of its footstalk, to this outer coat, lamen, or folding, it is observable, that some time before the lowermost branch is entirely withered, this green circular coat, which to the eye appeared some days before to be a solid part of the tree, splits open lengthways, from the setting on of the branches to the Ash-coloured part beneath, being about five feet in length, and the circumference of the tree in the breadth, and peeling off, it falls with the branch, to which it is joined by many strong cartilages, leaving the next succeeding coat to appear for a time as a constituent part of the tree, till a succeeding withered branch carries this off likewise. The several exfoliations of the green part of this stately tree are equal in number to the branches. The first, second, third, and sometimes the fourth of these laminæ are green on the outside, and perfectly white within: all the remaining inner coats, or foldings, are of a bright lemon colour without, and white within. When these very tough husky exfoliations are taken off, what is called the Cabbage, lies in many thin, snow-white, brittle flakes, in taste it resembles the flavour of an almond, but sweeter: it is so full of oil, that a curious observer may see several very small cells abounding with it. These flakes are called, from some similarity in the taste when boiled, Cabbage; it eats agreeably sweet.

What is called the Cabbage-flower grows from that part of the tree where the Ash-coloured trunk joins the green part already described. Its first appearance is a green husky spatha, growing to above twenty inches long, and about four abroad; the inside is full of white, stringy filaments, with alternate, protuberant knobs; the smallest of these resemble a fringe of coarse, white thread knotted: these are very numerous, and take their rise from larger foot-stalks; and these footstalks likewise are all united to different parts of the large parent stalk. If this husky spatha is opened, while young, a farinaceous, yellow seed, resembling fine saw-dust, is very plentifully dispersed among these stringy filaments, these filaments being cleared from the dust, are pickled and

esteemed among the best pickles in Europe. But if this spatha is suffered to continue on the tree till it grows large, and bursts; the inclosed part, which whilst young and tender, was fit for pickling; will by that time have acquired an additional hardness, become soon after ligneous; grow bushy, consisting of very small leaves, and in time produce a great number of small, oval, thin-shelled nuts, of the size of unhusked coffee-berries. These, being planted, produce young Cabbage-trees.

Culture of the CABBAGE-TREE.

These plants may easily be produced from the nuts, before mentioned, provided they are fresh. Sow them in pots filled with light, rich earth, plunge them into a moderate hot-bed of tanners bark, which should be kept in a moderate temperature of heat, and the earth frequently refreshed with water. When the plants are come up they should be each planted in a separate pot, filled with the same rich earth, and plunged into a hot-bed again. The earth should be prepared in the following manner; half light, fresh earth from a pasture ground, and half sea sand and rotten dung, or tanner's bark, in equal proportion; these should be carefully mixed, and laid in a heap at least four months before it is used. It should often be turned over, to prevent the growth of weeds, and to sweeten the earth.

Be careful to water the plants and to let them have fresh air in proportion to the warmth of the season, and the bed in which they are placed.

Whenever these plants are removed, which should be done at least once a year; you must be very careful not to injure their roots, which is very hurtful to them. They should always be kept in the bark-bed of the stove, otherwise they will not make any great progress in England. When they do thrive, in about twenty years, they grow too tall for any stoves which are at present built here, and there is very little hope of ever seeing them produce their fruit in our climate; but the great beauty of their waving foliage, renders them well worthy our care.

CABBAGING, a term used for several plants, whose leaves turn in, and become hard like a Cabbage.

CABINET, in gardening a small building in manner of a summer house; it is open on all sides, and forms an agreeable place of retirement for taking the fresh air under cover.

CACTUS, *Melon Thistle*. See the article **MELON THISTLE**.

CALABASH-TREE, *Crescentia*. Of this tree there are two different species. 1. Calabash-tree with oblong narrow leaves, and a large oval fruit. 2. Broad-leaved Calabash-tree, whose fruit hath a tender shell.

The first sort grows naturally in Jamaica and in all the Leeward Islands: this hath a thick trunk, covered with a whitish bark, which rises from twenty to thirty feet high, with several knots upon the stem, dividing at the top into many branches, which spread and form a regular head. These are furnished with leaves which come out irregularly, and are about six inches long, oval, and acuminate; of a livid green colour, with very short foot-stalks.

The flowers are produced from the sides of the branches, standing upon long foot-stalks. The fruit is a large shell, either spherical, oval, or bottle-shaped, and incloses a number of flat cordated seeds.

These shells are large enough to contain three pints or two quarts of liquid; they are often used for drinking cups, and other purposes.

The second species of Calabash, is found in Campeachy, which does not rise so high as the former, and the leaves, flowers, and fruit are considerably less.

Culture of the CALABASH-TREE.

These trees are too tender to live in the open air of our climate, consequently they require the help of the stove. They are easily propagated by seeds, which, when fully ripe, should be brought over in the fruit. The seeds must be sown in the spring on a good hot-bed, and when the plants are fit to remove, they should be each set into a small halfpenny pot, and plunged into a

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hot-bed of tanners bark, shade them from the sun till they have taken fresh root; keep them in the tan-bed of the stove, and give them but little water in winter. In summer they will require to be gently watered two or three times a week, according to the warmth of the season, and should have a large share of air admitted to them. These plants may also be propagated by cuttings.

CALF'S-SNOOT, a species of *Antirabinum*, a genus of plants, classed by Linnæus among the *didynamia angiospermia*; it comprehends the Calf's-Snout, strictly so called, or Snap-Dragon, the Bastard-Asarum, and the Toad-flax.

Of this genus there are twenty-eight species, too many for a particular description here; we shall therefore consider them in general as divided into the Calf's-Snout, or Snap-Dragon, Bastard-Asarum, and Toad-flax.

Culture of the CALF'S-SNOOT.

Most sorts of the Calf's-Snout, or Snap-Dragon, are very beautiful plants, and much esteemed in gardens, and are all easily propagated from seeds, which must be sown in a dry soil, not too rich, in April or May.

In July the plants may be planted out in large borders, where they will flower the spring following; or they may be sown early in the spring, and they will then flower in the next autumn; but then they are not so likely to stand the winter, and if the autumn prove not kindly, they will hardly produce a perfect seed. They all grow very well on old walls, where they have happened to sow themselves.

The sorts of Bastard-Asarum may be propagated by seeds sown in autumn, soon after they are ripe; when the plants come up, they should be kept clean from weeds, and thinned where they grow too close, which is all the culture they will require. The several sorts of Toad-flax cultivated in the gardens, are propagated by seeds, which should be sown in the spring on the border of the flower-garden, where the plants are designed to remain. When the plants come up they should be kept clean from weeds, and thinned where they grow too close, being all the culture necessary for them; or the seeds may be sown in autumn, upon a dry border; and if the plants will live throughout the winter, they will be larger, and flower earlier and stronger than those that arise from seeds sown in the spring.

CALLA, *Arum*. See the article **ARUM**.

CALAMINT, a species of Mint. See the article **MINT**.

CALAMINTH, a species of Baum. See the article **BAUM**.

CALAMUS Aromaticus. See **ACORUS**.

CALLICARPA, *Johnsonia*, a genus of plants, ranged by Linnæus among the *tetandria monogynia*, and of which there is but one known species.

This is a shrubby plant, of irregular growth, the root penetrates deep into the earth; the stem is covered with a brown bark; the branches, which are very numerous, spread irregularly, and are of a pale olive-colour.

The leaves are round, small at their base, lightly notched at the edges, and of a pale green; they are placed in pairs, on short foot-stalks, and are soft to the touch, being covered in a light manner with a whitish, woolly substance. The flowers are placed in clusters, round the twigs, at the insertions of the leaves. Their colour is a pale red.

Culture of the CALLICARPA.

It grows naturally in Virginia and Carolina, and will live with very little trouble in our gardens; it is propagated by sowing the seeds, which should be procured from their native places. They must be sown on a bed of fresh earth in a nursery, and weeded and watered till they are four or five inches in height, at which time they may be either planted out in another bed, or removed at once into the places where they are to remain. They may afterwards be increased by layers, or by cuttings, carefully managed; but either way we would advise the gardener to leave them to nature in their form of growth, for they never appear more to advantage than in their wild shape.

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CALTROPS, *Tribulus*, a genus of plants, ranged by Linnæus among the *decandria monogynia*, and of which there are four species; 1. Caltrops, with four pair of lobes to each leaf, of which the outer ones are the largest. 2. Caltrops, with five pair of almost equal lobes to each leaf. 3. Caltrops, with six pair of almost equal lobes to each leaf. 4. Caltrops, with eight pair of almost equal lobes to each leaf.

Culture of the CALTROPS.

These are all annual plants. The first is a native of Jamaica, and the second of Ceylon; they are propagated by seeds, which should be sown on a hot-bed early in the spring: and when the plants are come up, they must be each transplanted into a separate pot, filled with rich, light earth, and plunged into a hot-bed of tanners bark, where they should be treated in the same manner with other tender exotic plants. The third sort is a native of the southern parts of Europe, and is propagated by seeds, which should be sown in autumn, on an open bed of fresh light earth. In the spring, when the plants come up, let them be carefully cleared from weeds, and thinned where they grow too close; after which they will require no other culture but to be kept clean from weeds: and if their seeds are permitted to scatter, they will come up the spring following, and maintain their place, provided they are not choaked up with weeds. The fourth sort is a native of the warmest parts of America, and may be treated like the first and second species.

CALYPTRA, a thin membranaceous involucre, usually of a conic figure, which covers the part of fructification. The capsules of most of the mosses have calyptræ.

CALYX, among botanists a general term, expressing the cup of flowers, or that part of a plant which surrounds, incloses, or supports the other parts of the flower. The cups of flowers are very various in their structure, and are distinguished by the names of perianthium involucre, spatha and gluma. Botanists distinguish two sorts of Calices, one external, called the Calyx of the flower: by the ancients perianthium, as encompassing the flower and seed; the other internal, called the Calyx of the fruit: by the ancients pericarpium, as being the capsule which compasses the fruit, and is itself encompassed by the petals. The external Calyx may also be divided into two sorts, one which surrounds the flower, another which sustains it, different from the pedicle; as the latter spreads itself underneath the flower, to give room for the nutritious juice to raise more freely; the cavity of the pedicle enlarged, is reputed part of the Calyx both external and internal.

CAMPANIFORM-FLOWER, or **CAMPANULATED-FLOWER**, a term for flowers resembling a bell in shape, and making the character of Mr. Tournefort's genera; he defines the Campaniform flower to be composed of one leaf, and formed in the shape of a bell, but with some difference in the figure, which constitute four subordinate species. 1. The Bell-Flower, simply so called, which expresses no other figure but what is expressed by that name. 2. The tubular, narrow kind, which is always considerably long. 3. The expanded kind, which opens very wide at the extremity, and represents in some degree, a dish or basin; and 4. The globular Bell flower, the mouth of which is narrower and smaller than the belly.

CAMPANULA, *Bell-Flower*, a genus of plants, classed by Linnæus among the *pentandria monogynia*, and of which there are no less than thirty-four distinct species, too great a number for a particular description in this work; many of them, indeed, grow wild in our fields, and, therefore, are not worthy of it, being never admitted into gardens. Those which demand most the attention of the curious, are the violet-coloured African Campanula, and the Canary Bell-Flower.

Violet coloured African CAMPANULA.

This plant derives its English name from the colour of its flowers, which are of a deep blue purple. Linnæus calls it Campanula with rough, indented, spear-pointed leaves, with very long footstalks to the flowers, and

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and slender seed vessels. It is a native of the East Indies, and of the Cape of Good Hope.

It is an annual fibrous rooted plant; the stalk is round, a little hairy, tolerably firm, purplish near the ground, and of a paler green upwards. The leaves are long, narrow, sharp-pointed, indented at the edges, of a lively green, and without footstalks; from these rise numerous branches, from the bosoms of whose leaves again rise others; which gives the plant a most beautiful bushy appearance. The lesser branches terminate in long slender naked twigs, which serve as footstalks to the flowers; and some rise of an equal length with the others, from the upper leaves on the main stalks. At the summit of each stands one flower, very conspicuous in size, shape, and colour. It is so large, that the tender footstalk usually bends with it, and of a bell-like form; its colour, as above-mentioned, is that of the Violet.

Culture of this CAMPANULA.

This elegant plant, in its natural climate, grows in a loose, but rich soil, and such we must give it here. It is raised from seeds, which should always, if possible, be obtained from their native place, being much better than those ripened here.

Mix a compost for them of equal parts of light earth from a dry pasture, and mud from a pond, with a very small admixture of sand; one bushel of this to six of the others is sufficient. Early in spring let a heap of this mixed soil be prepared; and at the same time a hot-bed raised for the seeds, and covered well with good garden mould. In this let them be sown, and covered only a quarter of an inch deep. When the plants have acquired a little strength, remove them into another hot-bed, water and shade them till they have taken root; let them remain in this till large enough to be transplanted into pots. For each plant there must be a separate pot of a middling size; lay some stones in the bottom to secure the opening from being clogged up, and then let it be half filled with the compost.

Raise the plant with as much of the earth as can be kept about it. Set it upright in the pot, and place more of the compost round it; raise the earth within an inch of the top of the pot, and then give the plant a gentle watering. Set the pot up to the rim in a bark bed, shade and water it at times till rooted; when they are thus well rooted, the air must be admitted to them by degrees, by lifting up the glasses of the frame with a notched stick during the heat of the day; after this has been done for a week, they should be set out in the middle of a hot day among the green-house plants, at night removed into the green-house, and set out again the next day. Thus they will be hardened thoroughly, and soon after they will bud for flowering. Now water them gently twice a day, and they will produce their first flowers towards autumn. These, when they fade, must be carefully taken off, otherwise they will produce no more good flowers, but by taking them off as they decay, there will be a succession for more than two months. If the weather becomes cold early, remove them into the green-house, and, if need require it, into the stove, where they will continue flowering till the middle of November.

Canary Bell Flower, or CAMPANULA.

Linnæus, as a distinction of the species, calls this beautiful plant, Campanula with spear-pointed, and dentated leaves, placed opposite on footstalks, and with five cells in the seed-vessels.

The root is tuberous and hung about with fibres; the stalk is round, upright, and rises to the height of six or seven feet; it is purplish at the bottom, and of a pale green upwards. The leaves rise two, and sometimes three at a joint; they are of a beautiful greyish green, are distant from each other, and from their bosoms generally shoot up some young stalks, which give a very elegant tufted appearance to that part of the plant where they are situated. They have long, slender, and reddish footstalks, and are of the shape of a spear-point, with two beards at the bottom, and serrated at the edges.

The flowers are large and elegant, their colour is a

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bright flaming yellow, tinged with red; they hang drooping, and are of the perfect bell-shape.

Culture of this CAMPANULA.

The best method of propagating this plant is by parting the roots, which may always be had, as there are few gardens without it. When the stalks which flowered are decayed, the period of rest for the roots, they may then be parted without danger. This should be done with a careful hand, and the principal root very lightly touched.

Have the following compost ready: take two bushels of upland pasture ground, one bushel of wood-earth, and half a bushel of sand; mix all these well together, and let them be exposed to the air from November to Midsummer.

Fill as many pots with this compost as there are roots for planting, and place each root carefully in the middle of the pot. Cover it two inches with the same soil, and give them a gentle watering; set the pots in a warm shady place, and once in four days sprinkle the mould lightly till they begin to shoot; when they are a few inches high, let the waterings be larger and more frequent. In the beginning of September they must be set among the exotics; and at the approach of cold nights removed into the green-house. Thus they will flourish perfectly well, and beginning to flower about November, will continue through the whole winter. In March the flowering season will be over, and the stalks will soon after begin to decay; but they rise again in all their vigour in the beginning of August, and flower as in the preceding season.

CAMPFIRE TREE, a species of the Bay Tree. See the article **BAY TREE**.

CAMPION, a species of a genus of plants better known by the name of *Lychnis*. See the article **LYCHNIS**.

Wild CAMPION, *Agrostema*, commonly called wild *Lychnis*, a genus of plants classed by Linnæus among the *decandria pentagynia*, and of which there are four species. 1. Hairy Campion, with cups equalling the Corolla, and entire naked petals. 2. Smooth Campion, with narrow spear-shaped leaves, and coronated petals. 3. Hairy Campion, with oval, jagged leaves, and entire coronated petals. 4. Hairy Campion, with emarginated petals.

Culture of the CAMPION.

The first species grows wild in our corn-fields, and is never cultivated in gardens. The second is a native of Sicily, and is propagated here only for the sake of variety. They are both annual plants. The third species is a biennial plant, it grows naturally in Italy, and is propagated by seeds, or by parting of the roots. There are two sorts of it, single, and double, the latter never produces seed, it is therefore propagated by parting of the roots in autumn, which should be planted in a border of fresh undunged earth, at the distance of half a foot from each other. Let them be watered from time to time till they have taken root, and in spring transplant them into the borders of the flower-garden. The fourth species is a native of Switzerland, and is propagated by seed, which should be sown in a moist soil, and a shady situation.

CANDY TUFT, *Iberis*, or *Sciatica cress*, a genus of plants classed by Linnæus among the *tetradynamia siliculosa*, and of which there are nine species. 1. Shrubby Candy Tuft, with entire wedge-shaped, blunt leaves, commonly called Tree Candy Tuft. 2. Shrubby Candy Tuft with narrow, acute, entire leaves, commonly called perennial Candy Tuft. 3. Shrubby Candy Tuft, with leaves indented at the top. 4. Candy Tuft, with roundish crenated leaves. 5. Candy Tuft, with spear-shaped, pointed leaves, the under ones sawed, and the upper entire, commonly called Candy Tuft. 6. Candy Tuft, with spear-shaped, undivided leaves, and hemispheric carymbuses. 7. Candy Tuft, with acute, spear-shaped, indented leaves, and flowers growing in bunches. 8. Candy Tuft, with narrow leaves, dilated and sawed at their top. 9. Candy Tuft, with sinuated leaves, and a single naked stalk, called Rock Cress.

Culture

Culture of the CANDY TUFT,

The three first species are shrubby plants; the first is a native of Sicily and Persia, and very seldom produces seeds in this country, but flowers all the winter; it is therefore propagated by cuttings only, which should be planted during some of the summer months, shaded from the sun, and duly watered; in about two months after, they will be rooted, and then they may be planted in pots, or in the borders where they are designed to stand. This sort being somewhat tender is generally preserved in green-houses in the winter, but in moderate weather it will bear the open air, if planted in a warm situation, and a dry soil, and covered in very hard frosts with mats, reeds, straw, or peas-haulm. There is a variety of these with variegated leaves, preserved in some curious gardens; but this not being so hardy as the plain sort, must be treated more tenderly in winter. The second species is native of Crete, and continues green all the year, and the flowers are of as long duration as those of the first sort; it rarely produces seeds in England, and is propagated by slips, which in summer easily take root; and the plants may be treated in the manner directed for the first sort. The third species is a native of Gibraltar in Spain, and may be propagated like the second sort. The fourth grows naturally on the Alps, and is a perennial plant, propagated by seeds which should be sown on a shady border in autumn, and when the plants are strong enough to be removed, they should be transplanted on a shady border, where they are designed to remain. They will require no other culture but to be kept clean from weeds. The rest are all annual plants. The seeds of the fifth were formerly sown to make edgings for borders in the pleasure garden: for this sort there are two different varieties, one with red, the other with white flowers. As these plants will not bear transplanting, the seeds should be sown in thin patches, and when the plants are grown pretty strong, they should be so thinned as to leave no more than six or eight in a patch to flower; they will require no other culture but to be kept clean from weeds. The sixth sort is a native of Crete; the seventh of Switzerland; these require the same treatment with the fifth: the eighth is preserved in botanic gardens, only for the sake of variety, and may be propagated as has been directed for the fifth species: the ninth grows naturally on sandy and rocky places in several parts of England, and is seldom admitted into gardens.

Indian Flowering CANE, a genus of plants ranged by Linnæus among the *monandria monogynia*, and of which there are three species. 1. Common broad-leaved, Flowering Cane. 2. Indian Flowering Cane, with a pale red flower. 3. Indian Cane, with glaucous leaves, and a very large flower. The first species grows naturally in both Indies: it has a thick, fleshy, tuberous root, divided into many irregular knobs. It sends out a number of irregular leaves without any order, they are near a foot long and five inches broad in the middle, lessening gradually at both ends and terminating in a point. The stalks are herbaceous, rising four feet in height, and are encompassed by the broad leafy footstalks of the leaves; at the upper part of the stalk, the flowers are produced in loose spikes, each being at first covered by a leafy hood, which afterward stands below the flower, and turns to a brown colour. The flower is encompassed by a three leaved empalement, which sits upon a small, roundish, rough germen, which after the flower is fallen, swells to a large fruit or capsule, oblong, rough, and is crowned by the three leaved empalement of the flower which remains. When the fruit is ripe, the capsule opens lengthways into three cells, which are filled with round, hard, black, shining seeds.

The second sort grows naturally in Carolina, and some of the other northern provinces of America. The leaves of this sort are longer than those of the former, and terminate in sharper points. The stalks grow taller and the segments of the flower are much narrower; the colour is a pale red, which makes no great appearance. The seeds are like those of the former sort.

The third species is a native of New Spain. The

roots of this are much larger than either of the former sorts. The stalks rise to the height of seven or eight feet; the leaves are near two feet long, narrow, smooth, and of a sea green colour; the flowers, which are large and of a pale yellow colour, are produced in short, thick spikes at the extremity; the seed-vessels are larger and much longer than those of the other sorts, but contain fewer seeds, which are very large.

Culture of the INDIAN FLOWERING CANE.

All the species are propagated by seeds, which should be sown in the spring on a hot-bed. When the plants are fit to remove, transplant them, each into a separate small pot, and plunge them into a moderate hot-bed of tanner's bark; shade them till they have taken root after which the air should be freely admitted to them, in warm weather. As these plants will make great progress in their growth, they must be shifted into larger pots, and part of them plunged into the hot-bed again, in June the others may be placed abroad in a warm situation, among the exotics. Those which are placed in the hot-bed, will be strong enough to flower in the stove the following winter; but those in the open air, will not flower till the next summer. These may remain abroad till the beginning of October, when they must be removed into the stove.

The second sort which is much hardier than the first and third, should have a different treatment. The young plants of this must be earlier intured to the open air, where they may remain till the frost begins, then they should be placed in the green-house. Give them but little water in winter; in the beginning of May turn them out of the pots, and plant them in a warm south border, in a dry soil, where they will thrive and produce flowers annually.

Sugar-CANE, *Saccharum*. There is but one species of this plant. It is a native of both Indies, and propagated in our gardens as a curiosity, but being too tender to thrive here unless it is preserved in a warm stove, it cannot be brought to any perfection.

Culture of the SUGAR-CANE.

It is propagated here by slips taken from the sides of the older plants; those which are taken from near the root, and have fibres to them, will most certainly grow, so that when the shoots are produced at some distance from the ground, the earth should be raised about them, that they may put out fibres before they are separated from the mother plant. These slips should be planted in separate pots, and plunged into a moderate hot-bed of tanner's bark. These plants must always be kept in the tan-bed of the stove, and as their roots increase in size, the plants should from time to time be shifted into larger pots; but this must be done with caution, for if they are over-potted, they will not thrive; they must be watered frequently in warm weather, but it must not be given them in too great plenty, and in cold weather, a very small quantity will suffice.

As the leaves of the plants decay, they should be cleared from about the stalks, for if these are left to dry upon them, it will greatly retard their growth. The stove in which these plants are placed, should be kept in the same temperature of heat as for the Pine-apple, and in hot weather the air should be admitted to them freely, otherwise they will not thrive.

Dumb-CANE, a species of the Arum. See the article ARUM.

This plant is a native of America, it abounds with an acrid juice, so that if a leaf or part of the stalk is broke, and applied to the tip of the tongue, it occasions a very painful sensation.

Culture of the DUMB-CANE.

It is propagated by cutting off the stalks into lengths of three or four joints, which must be laid to dry six weeks or two months, that the wounded part may have time to heal before they are planted, otherwise they will rot. Fill some small pots with light sandy earth, and plant one cutting in each pot, then plunge them into a moderate hot-bed of tan; be careful that they have little water till they have taken root. Some of them may be placed in a dry stove, and others plunged into the

the tan-bed, in the bark-stove, where they will make the greatest progress, and produce more flowers than the others.

BAMBOO-CANE, a species of the Reed. See **REED**.

Fishing-rod **CANE**, a species of the Reed. See the article **REED**.

CANTERBURY-BELL, a species of the Campanula. See the article **CAMPANULA**.

CAPER-BEAN. See **BEAN-CAPER**.

CAPER-BUSH, *Caparis*, a genus of plants of which there are ten species. 1. Prickly Caper. 2. Smooth Caper, with oval leaves, which remain all the year. 3. Smooth Caper, with oval oblong leaves, growing in clusters, which continue through the year. 4. Caper, with oval, spear-shaped leaves, which continue through the year, and a tree-like stalk. 5. Caper, with spear-shaped, veined leaves, which continue through the year, and flowers growing in bunches. 6. Caper, with oval leaves placed opposite, which continue through the year, and flowers growing in bunches. 7. Caper, with oblong oval leaves, placed alternate close to the stalks, which continue through the year, and flowers growing singly from sides of the branches. 8. Caper, with pointed spear-shaped leaves, growing in clusters, which continue through the year, and a shrubby stalk. 9. Caper, with spear-shaped leaves placed alternate, on very long foot-stalks, and flowers growing in clusters. 10. Caper, with nervous spear-shaped leaves, which continue through the year, and three flowers upon each foot-stalk.

The first is the common Caper, whose full grown flower-bud is pickled, and brought to England annually from Italy and the Mediterranean. This is a low shrub, which generally grows out of the joints of old walls, the fissures of rocks, and amongst rubbish, in most of the warm parts of Europe: it hath woody stalks, which send out many lateral, slender branches; under each of these are placed two short, crooked spines, between which and the branches come out the foot-stalk of the leaves, which are single, short, and sustain a round, smooth, entire leaf; at the intermediate joints between the branches, come out the flowers upon long foot-stalks; before these expand, the bud, with the empalement, is gathered for pickling; but those which are left expand, in form of a single Rose, having five large white petals, which are roundish and concave; in the middle are placed a great number of long stamina, surrounding a style which rises above them, and is crowned with an oval germen, which afterward becomes a capsule, filled with kidney-shaped seeds.

This sort is cultivated upon old walls about Toulon, and in several parts of Italy; and Mr. Ray observed it growing naturally on the walls and ruins at Rome, Sienna, and Florence.

The second sort hath weaker stalks than the first, which are smooth, having no spines on them; the leaves are oval, smooth, in their natural place of growth, continue through the year; but in England the young shoots are generally killed in winter; the buds of these are not esteemed so good as the first for pickling.

The third, fourth, and fifth sorts, are natives of New Spain; the sixth, seventh, and eighth, of America, and the ninth and tenth sorts grow naturally at Carthage.

The last eight sorts will not live through the winter in England, without the assistance of a stove. They are propagated by seeds, which must be procured from the places where they grow naturally; these must be sown in small pots, and plunged into a hot-bed of tan-bark. If the seeds are good, the plants will appear in about two months, give them a gentle watering, and in warm weather admit the air freely; when they are large enough to remove, they must be transplanted, each into a separate small pot, and plunged into the hot-bed again, observing to shade them till they have taken fresh root, after which admit the fresh air every day, in proportion to the warmth of the season. In autumn they must be removed into the stove, and

plunged into the bark-bed, where they should constantly remain. These plants require but little water, especially during the winter, for the roots are subject to rot with wet.

CAPILLAMENT, a term applied to the strings or threads about the roots of plants.

CAPILLARY-PLANTS, are such plants as have no main stem, but their leaves rise from the root, upon pedicles, and produce their seeds on the back of their leaves, as the Fern, Maiden-hair, &c.

CAPITATED-PLANTS, a name given to those plants, whose seeds, with their down, are included in a scaly calyx, or cup; of this sort are the Thistle, Artichoke, &c.

CAPITULUM, a little head, the same with what is otherwise called an Umbel.

CAPSICUM, Guinea Pepper. See the article **GUINEA-PEPPER**.

CAPSULATED-PLANTS, such as produce their seeds in capsules.

CAPSULE, a species of Pericarpium, composed of several dry elastic valves, which usually burst open at the points; this kind of Pericarpium contains only one cell, or cavity, sometimes more. In the first case it is called unilocular, in the second, bilocular, trilocular, or multilocular, that is, containing one cell, two cells, three cells, or many cells, according to the number of cells in it made for the reception of the seeds.

CARAWAY, *Carum*, a genus of plants, ranged by Linnæus among the *pentandria digynia*, and of which there is only one species.

Culture of the CARAWAY.

It is a biennial plant, and grows naturally in several parts of England, and in most of the northern parts of Europe, it is propagated by seeds, which should be sown soon after they are ripe. When the plants are come up, the ground should be hoed, to destroy the weeds, and the plants thinned where they grow too close, leaving them three or four inches apart. The following spring they must be hoed twice more, which will keep the ground clean till the seeds are ripe: then the stalks must be pulled up, and tied in bundles, setting them upright to dry, then the seeds may be threshed out for use.

CARINA, or **KEEL**. See the article **PAPILIONACEOUS**.

CARDINAL-FLOWER, a genus of plants, of which there are ten species. 1. Cardinal-Flower, with an erect stalk, spear-shaped, sawed leaves, and a spike of flowers, terminating the stalk, commonly called Scarlet Cardinal-Flower. 2. Cardinal-Flower, with an erect stalk, linear, spear-shaped, entire, acute-pointed leaves, and a spike of flowers terminating the stalk. 3. Cardinal-Flower, with an erect stalk, oval, spear-shaped, crenated leaves, and the sinuses of the empalements reflexed, commonly called the Blue Cardinal-Flower. 4. Cardinal-Flower, with an erect stalk, heart-shaped leaves, which are somewhat indented, having foot-stalks, and the longest spike of flowers, which are placed thinly. 5. Cardinal-Flower, with an erect stalk, the lower leaves roundish and crenated; the upper spear-shaped, sawed, and a spike of flowers terminating the stalk. 6. Cardinal-Flower, with an erect stalk, oval leaves, which are somewhat sawed, longer than the foot-stalk, and swelling seed-vessels. 7. Cardinal-Flower, with oval, crenated leaves, which are downy, and flowers growing singly from the sides of the stalk. 8. Cardinal-Flower, with spear-shaped, indented leaves, very short foot-stalks to the flowers, which proceed from the sides of the stalks, and a very long tube to the petal. 9. Cardinal-Flower, with a spreading, branching stalk, spear-shaped leaves, which are somewhat indented, and very long foot-stalks to the flowers. 10. Cardinal-Flower, with trailing stalks, spear-shaped, sawed leaves, and foot-stalks proceeding from their sides.

The first sort grows naturally by the side of rivers and ditches in great part of North America, but has been many years cultivated in the European gardens for the great beauty of its scarlet flowers. The root is composed

Composed of many white fleshy fibres; the lower leaves are oblong, a little sawed, and of a dark purplish colour on their upper side; the stalks are erect, and rise about a foot and a half high, garnished with spear-shaped leaves, sawed on their edges, having very short foot-stalks, and are placed alternately; the stalk is terminated by a spike of flowers of an exceeding beautiful scarlet colour; these have a pretty long tube, which is a little incurved, but at the top is cut longitudinally into five segments; the three upper, which are the smallest, are greatly reflexed; the three under, which form the lower lip, are larger, and spread open.

The second sort grows naturally at Campeachy, and this hath a fibrous root like the first. The stalks are much larger, and rise a foot higher; they are closely garnished with leaves, which are long, smooth; and entire, ending in acute points, and are terminated by short spikes of flowers, which are larger than those of the first sort, but are of the same beautiful scarlet colour.

The third sort is a native of Virginia, but has been long an inhabitant of the English gardens; this hath a perennial fibrous root; the leaves are smooth, oval, spear-shaped, and a little indented on their edges; the stalks rise a foot and a half high, garnished with leaves like those of the bottom, which are gradually smaller to the top, sitting close to the stalk. The flowers come out from the wings of the leaves, they are of a pale blue colour, and have large empalements, whose edges are reflexed.

The fourth sort grows naturally in Jamaica; this is an annual plant; the stalk rises a foot high, then divides into four or five smaller, which grow erect. The lower part is garnished with heart-shaped smooth leaves, having small indentures on their borders, and stand upon short foot-stalks. The upper slender stalks are thinly garnished with small purplish flowers to the top, and are succeeded by small seed-vessels, which ripen in autumn.

The fifth sort grows naturally in the forests about Blois in France; this is an annual plant. The sixth species is a native of North America, this is a biennial plant in England, which rarely flowers the same year as the plant comes up, but decays soon after the seeds are ripe.

The seventh sort is a native of the Cape of Good Hope, this is likewise a biennial plant.

The eighth species grows naturally in moist places on most of the islands of the West Indies. It is also a biennial plant.

The ninth and tenth sorts are, like the seventh, natives of the Cape of Good Hope; but they are annual plants.

Culture of the CARDINAL FLOWER.

The first species is propagated by seeds, which when they are ripened in England, should be sown in autumn in pots, and placed under a common hot-bed frame; or, if the seeds come from the country where the plants grow naturally, they should be sown in the same way as soon as they arrive, for if they are kept out of the ground till spring, they will lie a year in the ground before they vegetate. The pots in which these seeds are sown, should be exposed to the open air, at all times, when the weather is mild, but they must be screened from the frost, and very hard rain in winter. In the spring the plants will appear, when they should have as much free air as possible in mild weather, and, if the spring proves dry, they must be frequently refreshed with water. As soon as they are fit to remove, they should each be planted in a separate small pot, and placed in the shade till they have taken fresh root, after which set them where they may have the morning sun, in which situation they may remain till autumn. In hot dry weather they should be constantly watered, and when the roots have filled the pots, they must be transplanted into larger. In autumn they must be placed under a common frame, to shelter them from hard frost, but when the weather is mild admit the open air. The spring following they should be shifted into other pots, and placed where they may have the morning sun, being

careful to give them gentle waterings in dry weather, which will cause their stalks to be stronger, and produce larger spikes of flowers, which will continue long in beauty if they are not too much exposed to the sun; and if the autumn proves warm, the seeds will ripen well in England.

The second species is propagated by seeds in the same manner as the first, but the plants not being so hardy, require to be placed in a moderate stove in winter, and in summer they should be set in a deep frame, where they may be covered with glasses in bad weather, admitting the air at all times when the weather will permit.

The third sort is propagated in the same manner as the first, and the plants require the same culture.

When the seeds of the fourth species are permitted to scatter on the pots which stand near them, and those are sheltered from the frost, the plants will come up plentifully the spring following; or, if they are sown in pots in autumn, and sheltered in the winter, the plants will rise the following spring, and these should be transplanted into separate small pots, and placed under a frame, where they will flower in June and July, and their seeds will ripen in September, when the plants will decay.

The seeds of the fifth species should be sown in autumn, in pots filled with loamy earth, and placed under a hot-bed frame in winter, and when the plants come up in the spring, they should be transplanted either into a border of soft loamy earth, or into separate pots, shading them till they have taken new root, afterwards they must be constantly watered in dry weather, which will cause them to flower strong, and produce good seeds annually.

The sixth sort is propagated by seeds, which should be sown in autumn, in pots filled with rich earth, and treated in the same manner as the first sort.

The seventh sort may likewise be cultivated in the same manner as the first.

The seeds of the eighth species should be sown soon after it is ripe in pots filled with rich earth, and plunged into the tan-bed in the stove. In the spring these pots may be removed and plunged into a hot-bed, which will soon bring up the plants; when these are fit to remove, they should be transplanted each into a separate small pot, and plunged into a fresh hot-bed, shading them from the sun till they have taken new root; then they may be treated in the same way as other tender plants from the same country, giving them a large share of air in warm weather. In autumn the plants must be plunged into the tan-bed of the stove, where they will flower the following summer, and produce ripe seeds, soon after which the plants will decay.

The seeds of the ninth and tenth species must be sown in autumn in pots, and sheltered under a common hot-bed frame in winter; in mild weather expose them to the open air, and carefully shelter them from the frost; and in the spring the pots should be plunged into a moderate hot-bed, which will soon bring up the plants; when these are fit to remove, they should each be planted in a separate small pot, and again plunged into a moderate hot-bed, shading them from the sun till they have taken fresh root; then admit the air freely, when the weather is mild, and as the plants grow strong they should be gradually inured to the open air, into which they must be removed in June, placing them in a sheltered situation, where they will flower in July; and if the season proves favourable, the seeds will ripen in September; but if the season should prove cold, it will be proper to remove one or two plants into a glass-case to obtain good seeds.

CARNATION, a beautiful tribe of flowers considered by Linnæus as a species of the *Dianthus*, which comprehends the Clove Gilli-flower, or July-flower, and the Carnation Pink, which we shall consider distinctly. The same author has classed them among the *decandria dygynia*, and enumerated fifteen species.

These flowers are either single or double, but the latter only are regarded by florists, nor even these except

cept they have particular appearances to recommend them.

The principal properties in a good Carnation are as follow: 1. The stem of the flower should be strong and able to support the weight of the flower, without lopping down. 2. The petals (or leaves) of the flower should be large, broad, stiff, laying flat, without any indentures on their edges; arising from the extremity to the centre regularly, so as to form the whole as nearly hemispherical as possible. 3. The pod should be cylindrical, neither too short nor too long, for if it is too short the extreme petals will fall down and much diminish the beauty of the flower, and if too long, the flower will be contracted, which is disagreeable to a curious eye: it is also esteemed a good property if the flower expands without the pod bursting, which it is very apt to do. 4. The colours should be bright, equally striped, on a pure white ground, for if there is one petal single coloured, it is called run, (in the florists language) and despised.

The florists class Carnations into five orders; the first they call flakes, these are of two colours only, and the stripes are large, going quite through the leaves; the second are called bizars, these have flowers striped or variegated with three or four different colours; the third are called piquetees, these flowers should always have a white ground, and are spotted or pounced with different colours; the fourth are called painted ladies, having their petals of a red or purplish colour, striped and are white underneath; the fifth sort are called bursters; these, if managed properly, grow exceeding large, and make a grand appearance; a kind of secondary pod arises in the middle, which should be carefully taken out when the flower is nearly expanded; this sort is not so much cultivated as formerly, the present taste being chiefly confined to (what the florists call) whole-blowing Carnations. Of each of these orders there are numerous varieties, and principally of flakes and bizars, which are most esteemed. To enumerate the varieties of the chief flowers in any of these orders, would be almost impossible, since every country produces new flowers every year from seeds; so that those flowers, which at their first blowing were greatly valued, are, when become common, little regarded, especially if they are defective in any one property: therefore where flowers are so liable to mutability, either from the fancy of the owner, or that better kinds are yearly produced from seeds, (which it may be remarked does not often happen) they always take place of older, or worse flowers, which are turned out to make room for them. These flowers are dignified with the greatest titles, such as emperors, kings, princes, dukes, dutchesses, earls, countesses, barons, with gentlemen and ladies out of number, which to enumerate (if it were possible) would require a folio volume. These flowers are propagated either from seeds (by which new flowers are obtained) or from layers, for the increase of those sorts which are worthy of preservation. The seeds should be collected from the best flowers, and sown in the spring in large pots, or boxes, on light, rich earth, and covered about a quarter of an inch with the same. These should be situated where they can receive the morning sun only, observing to water them when necessary. In about a month the plants will come up, which will be fit to transplant in July, taking, if possible, the advantage of moist weather, placing them about three inches distant, in beds of light, rich earth, and kept watered and shaded in sunshine weather, till they have got good rooting. Here they may continue till September, when every other one should be taken up and transplanted into other beds, in order to give room for the remainder; here they may remain till flowering, when the goodness of them may be determined, observing, if the winter proves severe, to cover them occasionally with mats, &c. When they begin to blow, all the single flowers, and those of one colour, should be pulled up, and none but those which are good should be reserved, which, to increase, may be layed down as soon as possible, which is in June or July, according to the condition of the

shoots; the method of doing which may be seen under the article **LAYERS**.

Florists transplant the layers, when they have got strong roots, into pots, in the size of which at first planting they differ. Some plant them in the large pots they are designed to blow in; others in small pots, which they shift in the spring into larger. This last method appears the most eligible, for if they are in small pots they stand in less compass, and are more easily protected from the severity of the winter; but those who plant them in large ones, shelter them with pots, which are open at the top and made for the purpose, for the cutting winds do them the greatest injury. In these pots are generally placed two plants.

Another method of increasing this plant, is by what is called piping (among florists;) the operation is, to cut the shoots quite off through a joint, and sticking them in rich earth, under a glass air tight: with some this practice succeeds very well, but in general it is precarious; however, the plants raised this way commonly spindle higher than those raised by layers.

When Carnations begin to spindle, they should be removed and placed on a stage made for the purpose, which generally have cisterns of water round each post; this is necessary, in order to prevent insects, particularly ear-wigs, from getting to the flowers, which if they are suffered to do, will soon destroy them, there being a sweetness at the bottom of the petals which these vermin are very fond of.

The choice in the situation of the stage is a very essential article for the well flowering of the plants. It must be defended from high winds, but not smothered by too much shelter; for unless the air comes freely among the plants, the flowers will never be fine. The stalks will soon rise for flower. Two may be suffered from one root, but a single one is better. There must be a stick planted in the pots for tying them up as they rise, and all side shoots must be taken off as they appear. When the buds put forth for flowering, the inner cup must be opened in three or four places, to favour the regular spreading of the petals; and it must be defended from wet, and too much sun by a glass cap, covered occasionally with a piece of bays, after this a piece of paper, or card, cut round with a hole in the centre, may be placed under the petals, and the gardener must from day to day, as they disclose themselves, favour their spreading, that they may be supported every where by this paper collar, while they hide it completely; and he is afterwards to lay the several petals handsomely one upon another; they will remain as they are placed, and make a very regular appearance.

While they are in flower they must be carefully watched to prevent destruction from insects, and watered frequently, but moderately, with water from a shallow pond, that lies exposed to the sun. By this method they will flower perfectly, and continue in their beauty as long as nature will permit; and by saving seeds from the finest kinds that ripen them well from time to time, the stock will be increased and improved every season.

Spanish CARNATION. See the article **BARBADOES-Flower-Fence**.

CAROB-TREE, or, *St. John's Bread*, a genus of plants of which there is but one known species.

This tree is very common in Spain, particularly in Andalusia, and in some parts of Italy, as likewise in the Levant. In England it is preserved as a curiosity, by such as delight in exotic plants. The leaves always continue green, and being different in shape from most other plants, afford an agreeable variety when intermixed with Oranges, Myrtles, &c. in the green-house.

Culture of the CAROB-TREE.

It is propagated from seeds, which, when brought over fresh in the pods, will grow very well; in spring they must be sown in pots, and plunged into a moderate hot-bed. In June inure them to the open air by degrees, and in July they should be removed out of the hot-bed, and placed in a warm situation, where they may remain till the beginning of October, when they should be removed into the green-house, placing them where

where they may have free air in mild weather, for being hardy they only require to be sheltered from severe frosts. When the plants have remained in the pots three or four years, and have got strength, some of them may be turned out of the pots in the spring, and planted into the full ground in a warm situation, where they will endure the cold of our winters very well, if the frosts are not remarkably hard, when that happens care must be taken to shelter them.

CARROT, *Daucus*, a genus of plants ranged by Linnæus among the *pentandria digynia*, and of which there are three species. 1. Carrot, with prickly seeds, or the common manured Carrot. 2. Carrot, with naked seeds, or the Visnaga. 3. Carrot, with plain rays to the Involucrum, and recurved jags, or the Gingidium, or Shining Maritime Carrot.

Culture of the CARROT.

The second and third species are natives of the southern parts of Europe, and being of no use, are preserved in botanic gardens only for the sake of variety.

The common manured Carrot has leaves divided into a number of narrow segments, and the root, which is fleshy, is too well known to require a description here.

This plant is propagated by seed, and delights in a warm, light, sandy soil, which should be pretty deep, and well worked, that the roots may with greater ease pierce into it; for if they meet with any obstruction, they are very apt to grow forked, and shoot out lateral branches, especially where the ground is too much dunged the same year that the seeds are sown; therefore the properest land for Carrots is ground that has been well dunged, and cropped at least a year before; (this is in respect to kitchen gardens,) but where the soil is fresh and fit for Carrots dunging is not necessary.

Carrots are sown at different times of the year, in order to be fit for use at different seasons: the first season is about Christmas, on warm borders. The second is in February or March, this is designed for the principal crop. For a third or autumnal crop, June or July is the time; and at the end of August some may be sown, in order to stand the winter, by which method early Carrots may be produced in March following, before the spring sowing is fit to draw. Previous to sowing the seeds, they should be well rubbed in the hands, to prevent their adhering together, which they are apt to do by forked hairs on their borders: and at the time of sowing a calm day should be chosen, for, being very light, if the wind blew it would be a difficult matter to sow them even. When the seed is sown, it should be trod into the ground, and afterward raked smooth.

When the plants are come up, they should be hoed out singly, at the distance of four inches. This is absolutely necessary, as it not only destroys the weeds, but refreshes the plants which are left, and adds greatly to their growth.

CASHEW NUT, *Acajou*, or *Anacardium*, a genus of plants of which we have but one species.

Culture of the CASHEW NUT-TREE.

This tree grows to a considerable height in its native country which is the West-Indies, but in England the plants are with great difficulty preserved; though by their first shoots from the seeds they appear so strong and vigorous, as to promise a much greater progress, than they are seen to make here. They are raised easily from the nuts, which are annually brought from America in great plenty; each of these should be planted in a small pot filled with light sandy earth, and plunged into a hot-bed of tanners bark, care must be taken to prevent their having any wet till the plants come up, for they frequently rot with moisture. They should always be set in the pots where they are to remain, for they seldom live after having been transplanted. If the nuts are fresh, the plants will come up in about a month after planting; and, in two months more, the plants will be four or five inches high, with large leaves; but they seldom advance much farther the same year.

The plants must be kept constantly in the stove, for they are too tender to live abroad in England, in the warmest season of the year, nor will they thrive in a

common green-house. As these plants abound with a milky acrid juice, they should have but little water, even in summer; and if they are watered sparingly in winter, once a month, it will be sufficient. The pulpy fruit, to whose apex this nut grows is as large as an Orange, and is full of an acid juice. The nut is of the size and shape of a hare's kidney, but is much larger at the end which is next the fruit, than at the other. The shell contains an inflammable oil, which has been very troublesome to those who have incautiously put the nut into their mouths to break the shell.

CASSADA, or *Cassava*, *Jatrova*, a genus of plants of which there are eight species. 1. Cassada with hand-shaped leaves, whose lobes are spear-shaped, entire, and smooth. 2. Cassada with leaves composed of five smooth lobes ending in points which are sharply indented on their edges, and a shrubby stalk. 3. Prickly Cassada with leaves having five lobes which are sharply cut on their edges, and an herbaceous stalk. 4. Prickly Cassada with leaves having three lobes, and an herbaceous stalk. 5. Cassada with hand-shaped, indented, prickly leaves. 6. Cassada with leaves divided into many parts, and bristly stipulæ with many points. 7. Cassada with angular, heart-shaped leaves. 8. Cassada with leaves divided into five parts, the lobes whereof are oval and entire, and branching bristles arising from the glands.

All these plants are natives of the warm parts of America. The first species is the common Cassada, which is cultivated for food. The inhabitants first express the juice out of the root, as having a poisonous quality, and then grind it into flour of which they make cakes or puddings, and esteem it an wholesome food.

Culture of the CASSADA.

The first sort is propagated by cutting the stalks into lengths of seven or eight inches, which when planted put out roots.

The other sorts are easily propagated by seeds, which should be sown on a good hot-bed in the spring, and when the plants are fit to remove, they should be transplanted each into a small pot, and plunged into a fresh hot-bed of tanners bark, shading them carefully till they have taken new root, after which admit fresh air to them daily in proportion to the warmth of the season; they require very little water, for they are soon destroyed by wet.

All these species, the fourth excepted, are perennial plants, so do not flower till the second or third year, therefore they should constantly remain in the tan-bed of the stove, giving them a large share of air in warm weather, but in winter they must be tenderly treated.

With this management the plants will continue several years, produce their flowers, and frequently perfect their seeds in England.

The fourth species is an annual plant and if the seeds are sown early in spring, and the plants brought forward, they will perfect their seeds the same year.

CASSIA, a species of the Bay-tree. See the article **BAY-TREE**.

CATALPA, a species of the Bignonia. See the article **BIGNONIA**.

Single **CATCHFLY**, a species of *Lychnis*. See the article **LYCHNIS**.

Label's **CATCHFLY**, a species of *Silene*. See the article **SILENE**.

CATERPILLAR PLANT, *Scorpinus*, a genus of plants of which there are five species. 1. Caterpillar with one flower upon a footstalk, and a pod covered with obtuse scales on every side. 2. Caterpillar with two flowers on each footstalk, and the outside of the pods armed with blunt spines. 3. Caterpillar with footstalks, having three flowers, and the outside of the pods armed with sharp distinct spines. 4. Caterpillar with flowers standing upon a footstalk, and the outside of the pods armed with sharp spines, which grow in clusters. 5. Caterpillar with a winged leaf.

The first species grows naturally in Spain and Italy. This is an annual plant, with trailing herbaceous stalks, and at each joint have one spatula-shaped leaf, with a long

long foot-stalk. From the wings of the leaves come out the foot-stalks of the flowers, which sustain at the top one yellow butterfly-flower; this is succeeded by a twisted thick pod, in size and appearance resembling a large Caterpillar, from whence it had this title.

All these plants are annual, and grow naturally in most of the warm countries in Europe; but the first sort has been long cultivated in the English gardens. They are preserved more for their singularity than for any great beauty.

Culture of the CATERPILLAR-PLANT.

The first species is the only one worth cultivating, the pods being large and more visible than the others, have more the appearance of a Caterpillar.

It is propagated by seeds, which should be sown upon a bed of light earth, and when the plants come up, they must be kept clean from weeds, and should be thinned, so as to leave them about a foot asunder, for their branches trail upon the ground; and if they have not room, they are apt to overbear each other. These plants seldom thrive well, if transplanted, therefore the best method is to put three or four good seeds in each place where the plants are to remain.

When the pods are ripe, they should be gathered and preserved in a dry place, till the following spring, to be sown.

CATKIN, or JULUS, is a cluster of flowers, only of one sex, affixed to an axis. Sometimes there are scales on the axis, which perform the office of cups; in others the flowers are naked.

CAULIFEROUS-PLANTS, are such plants as have a true stalk.

CAULIFLOWER, a species of the Cabbage or Brassica.

These plants have of late years been so far improved in England, as to exceed in goodness and magnitude those produced in most parts of Europe.

Culture of the CAULIFLOWER.

Great care should be taken in the choice of the seeds: they should always be raised from the best that can possibly be procured, for on this their goodness greatly depends.

In order to have very early Cauliflowers, the seeds should be sown on, or about the twenty-first day of August, upon an old Cucumber, or Melon-bed, which has entirely lost its heat; distribute them rather thinly than otherwise, and cover them about a quarter of an inch thick, with some fine sifted earth. If the weather proves very hot and dry, the bed should be shaded with mats, to prevent the too quick drying of the earth, and if there be occasion, it may be watered a little from time to time.

In about a month after sowing, the plants will be fit to prick out; this should be on other similar old Cucumber, or Melon-beds, covered with fresh mould; or, if these cannot be had, on beds made on purpose, with a little new dung, and covered with mould like the former. This dung should not be at all hot, for that would hurt the plants greatly at this season, which generally is sufficiently warm, and it should be trodden down very close, to prevent the worms from getting through it. The young plants should be set in this bed about two inches square asunder, and they should be shaded and watered there till they have rooted anew; but great care should be taken not to water them too much after they begin to grow, and likewise not to suffer them to receive too much rain, if the season should be wet, lest they should become black-shanked, as the gardeners term it, meaning rotten in the stem: for whenever this happens, the plant so affected is inevitably lost; they must be kept very clear from weeds in this bed, and about the thirtieth of October they should be transplanted from thence into the place where they are to remain during the winter.

This spot should be well defended from the north, east, and west winds, by walls, pales, or reed-hedges, which last are to be preferred, because the winds do not reverberate from them as they do from the former. The ground here, besides being naturally rich, should be

well and deeply trenched, and a good quantity of thoroughly rotten dung should be buried in it. If the soil is naturally wet, it should be raised up in beds about two feet and an half, or three feet wide, and four inches above the level of the spaces between them: but if it is moderately dry, the whole surface may be left flat. If it is a very dry soil, the plants should be watered a little, as soon as they are set; but by no means so as to make a puddle round them.

Along the middle of each of these beds, or of each breadth of ground that would be allotted for a bed, a row of the young plants of Cauliflowers now transplanted for the second time, should be set at such distances from each other, that there may be a clear space of about two feet and an half between the bell or hand-glasses, with which they are to be covered during the winter; at this time of planting them, two good plants should always be set under each glass, about four inches apart.

If these Cauliflowers are intended for a full crop, the rows should not be nearer together than three feet and a half: and if the ridges for Cucumbers are to be made between them, as is the general practice of the gardeners near London, they should be full eight feet asunder.

When the plants are thus set, the glasses should be put over them, and kept close down till they have taken root, which will be in about a week or ten days; but if a gentle shower of rain should fall in the mean time, it will be right to uncover the plants, that they may receive the benefit of it.

In about ten days after this planting, the glasses should be raised three or four inches on their south side, and supported there with forked sticks, or bricks, so that the air may have free access to the plants; and thus the glasses should remain over them night and day, except in frosty weather, when they should be let down again as close as possible: or if it should prove very warm, as often happens in November, and sometimes even in December; the glasses may be taken entirely off in the day time, and put on again at night, lest the plants, by being kept too close, should be drawn into flower at that season, as is frequently the case in mild winters, especially if they are not skilfully managed.

Towards the end of February, if the weather is mild, another good spot of properly fenced ground should be well trenched and dunged as before, and the least flourishing of the two plants under each glass, for the strongest is not to be removed any more, should be carefully taken up with a trowel, so as to preserve as much earth as possible about its roots, and at the same time not to damage the other.

The plants thus taken up are to be set in this newly prepared ground, at the same distance as before; the space from plant to plant, in the rows, should be twenty-eight, or thirty inches.

The plants left under the glasses should be earthed up, by drawing the mould towards their stems with a small hoe, as soon as the others have been removed from beside them: but in the doing of this great care must be taken not to let any of the earth fall into their hearts, lest it should rot them, or at least considerably injure their future growth.

After this earthing the glasses should be set over them again, but an inch or two higher than before, to give them more air, and with the precaution of taking them quite off, whenever gentle showers descend, for these will always greatly refresh the plants. When they begin to grow fast, and to fill their glasses with their leaves, which will not be long after this little stirring of the ground, the earth around them should be dug as deep, and as near to the plants as possible, without hurting them, for this will speedily bring them very forward. In this digging, a kind of border may be raised around them, broad enough for the glasses to stand on, and about four inches high, which, with the farther help of a continuation of props to support them, so as to let in the air, will give the plants such increase of room that the glasses may be continued over them till April: an advantage which they could not otherwise

enjoy, without prejudice to their leaves, and of so much the greater consequence, as there are frequently in this country such severe returns of frost about the latter end of March, as would greatly hurt these plants, especially after having been tenderly nursed under glasses.

When the plants removed into the new spot of ground have been set, glasses should be placed over them very close, till they have taken fresh root; the props of these glasses should then be raised pretty high, especially if the season proves mild, in order that there may be free access of air to the plants, to strengthen them; and in warm weather, as well as in gentle showers of rain, the glasses of these, and of the other plants, which were left standing, may be taken off entirely; for it will now be time to begin to harden them all by degrees, in order to enable them to bear the open air: but even while this is practised in the day, the glasses should be continued over them as long as possible at night, if there is the least danger of frost. A farther necessary caution relative to the day, is never to let the glasses remain upon these plants, when the sun shines very hot, especially if their leaves spread so as to press against the sides of the glass; for the moisture which arises from the ground, together with that which proceeds from the perspiration of the plants, has, by being detained upon their leaves, frequently been so heated by the next day's sun, powerfully heightened by means of the glass, as absolutely to scald all the larger leaves, to the great detriment of the plants, and sometimes to the destruction of them in such a manner, that they have not been worth cultivating afterwards.

If the plants have thriven well, some of them will begin to fruit by the end of April. It will therefore be necessary to look them over carefully, at least once a day, and where the flowers appear plainly, to break down some of the inner leaves, so as to cover it, and shade it from the sun, which would otherwise soon render it yellow and unsightly.

When the flower is full grown, which is known by the parting of its surface, as if it would run to seed, the whole plant should be drawn out of the ground; and if the flower is wanted for present use, it may then be cut out of the leaves; but if it be designed for keeping, it should be laid in a cool place, with its leaves about it; this is a much better method than that of cutting the heads off as they stand, and leaving their then useless stems in the ground, which serve only to taint the air around them. The most proper time for drawing them, is early in the morning, before the sun has exhaled any part of their moisture: for those that are gathered in the heat of the day, lose their natural crispness, and become tough.

The second crop of Cauliflowers, which the gardeners near London call the great crop, is that which generally supplies the markets here in May, June, and July. The seeds for this is somewhat of a more backward kind than those of the former, and they are also most commonly sown four or five days later; the manner of sowing them, and of managing the plants produced from them, is in all respects exactly the same as before directed for the early crop, until the end of October; from that time the practice of the London gardeners, who carry on a great trade in this article, is as follows.

Upon a couch of dung, beaten down close with a fork, in order to render it the more difficult for worms to pierce through, they place a layer of good fresh earth, about four or five inches thick.

The thickness of the dung is from six inches to a foot, according to the size of the plants, the smallest requiring most to bring them forward. The plants are set in this bed at the distance of about two inches and a half square from each other, and they are shaded and watered till they have taken new root. The number of these beds is proportioned to the quantity of the plants, and they are covered either with glass-frames, or with hoops, over which mats, &c. are spread, but great care is taken not to keep these coverings close, because of the warmth of the dung: for that which is used here, not having lost the power of fermenting, will occasion a consi-

derable damp, which would greatly injure the plants if it was pent in. When they have taken root, as much free, open air, as possible is given them, by taking the coverings off in the day-time, whenever the weather permits, and raising them up with props at night, unless the air is frosty: in this last case they are shut down close; and in very hard frosts, the glass-frames are covered with mats, straw, pease-haulm, &c. Great caution is likewise used to guard the plants against heavy rains in the winter; and if any of their under-leaves grow yellow, or decay, at that season of the year, particular care is taken to pick them off in as mild a day as can be chosen, because, should the weather prove so very bad as to occasion a necessity of keeping the covers close down for two or three days together, those decayed leaves would render the inclosed air so hurtful to the plants, then in a state of great perspiration from their close confinement, that numbers of them would soon be destroyed.

Early in February, if the weather is tolerably mild, they begin to harden the plants by degrees, in order to prepare them for transplantation. The ground into which they are to be transplanted, besides being quite open from trees, rather moist than dry, and well dunged and dug, as before directed, is, when managed in the most proper manner, sown with Radishes a week or a fortnight before the Cauliflowers are planted in it; this is a most excellent method; for if there are not some Radishes among them, and the month of May should prove hot and dry, as it sometimes is, the fly will seize the Cauliflowers, and eat numbers of holes in their leaves, to the great prejudice, if not to the entire destruction of the plants; whereas, if there are Radishes upon the spot, the flies will take to them, and never meddle with the Cauliflowers, while the others last.

Towards the middle of February, if the season is good, they begin to plant these Cauliflowers out in rows.

Some raise a third crop of Cauliflowers, by making a slender hot-bed in February, sowing the seeds thereon, sifting light mould over them to the thickness of about half an inch, and then covering the whole with glass-frames. When the plants have four or five leaves, they remove them into another hot-bed, where they plant them about two inches asunder every way; and in the beginning of April, they harden them by degrees, to fit them for being transplanted again; this is most commonly done in the middle of that month, at the distances before-mentioned, for the second crop, like which, this is from thenceforth managed in every respect. If the soil in which these Cauliflowers are planted, is light, and the season likewise reasonably moist and cool, they will produce heads fit to be cut about a month after the second crop is gone.

The table may be continually supplied with Cauliflowers after Michaelmas, through the months of October, November, and often a great part of December, if the season be favourable, and the soil good, by sowing them about the twenty-third of May, and transplanting them in the manner before-mentioned.

The gardeners about London have almost wholly laid aside the troublesome, expensive, and little useful practice of watering their Cauliflower plants in the summer; for experience has taught them, that if they are once watered, and it is not continued constantly, they had better never have had any; and that if care is taken to keep the earth close about their stems, and clear every thing away that grows near them, so that they may have free, open air, they succeed better without than with water.

CAULIS, a term used by botanists, to express the stalk, stem, or trunk of any plant.

CEDAR of *Libanus*, a species of the *Pinus* or Pine tree, according to Linnæus, but of the *Larix*, or Larch tree, according to other authors.

These are trees of great antiquity, but, till within these few years, little cultivated in England. They are not lofty, but their branches extend very far on every side their trunks.

C E D

The cones of this tree are frequently brought from the Levant, which, if kept entire, will preserve their seeds good for several years.

The best method of getting the seeds out, is to split the cones, by driving a pike of sharp iron through the centre lengthways, which will split the cone. But it will be proper, before you open the cones, to put them into warm water for twenty-four hours, which will render them much easier to split, and the seeds may be taken out with greater safety; for great care is required in the doing of it, for the seeds being very tender, will bruise if there is any force employed to get them out.

Culture of the CEDAR of Libanus.

When the seeds are taken out of the pods, let them be sown in boxes, or pots of light fresh earth, cover them with the same earth about half an inch deep, then place them in an east aspect, where they may have the sun till eleven in the morning, but great care must be taken to shade them in the middle of the day: for when they are too much exposed to the sun, the surface of the ground will dry so fast that it will prevent the seeds from vegetating. When the plants come up they must be guarded from the birds, otherwise they will peck off their tops; they must also be kept clean from weeds, and not placed under the drip of trees. The plants may remain in these boxes or pots in which they were sown till the following spring, but it will be proper to place them under a frame in winter, for while they are young they are in danger of losing their tops, if they are pinched by frost. In the spring, before the plants begin to shoot, they should be carefully taken up and transplanted into beds at about four inches distance, closing the earth gently to their roots; these beds should be arched over with hoops, and covered with mats in the heat of the day, to shade the plants from the sun till they have taken fresh root; and, if the nights prove frosty, it will be proper to continue the mats over them, but in cloudy or moist weather they must be taken off. After the plants are well rooted, they will require no other care than to keep them clean from weeds, unless the season should prove very dry, in which case it will be proper to give them a gentle watering once a week; but as too much wet is very often injurious to them, it will be better to screen them from the sun in hot weather to prevent the earth from drying too fast, or cover the surface of the ground with mulch to keep it cool, than to water the plants often.

In these beds the plants may stand two years, then they should be either transplanted to the places where they are designed to remain, or to a nursery, where they may grow two years more; but the younger these plants are when they are planted out for good, the better the trees will thrive, and the longer they will continue.

When these plants begin to shoot strong, the leading shoot is very subject to incline to one side, therefore in order to have them upright, their shoots must be supported with stakes, to keep the leaders straight, until they are grown to the height they are designed, otherwise their branches will extend on every side, and prevent their upright growth.

Bastard CEDAR, Theobromia, a genus of trees of which there is but one known species.

This tree grows naturally in most of the islands in the West Indies, where it rises to the height of forty or fifty feet, having a trunk as large as the body of a middle-sized man, covered with a dark brown furrowed bark, and sending out many branches towards the top.

Culture of the Bastard CEDAR.

It is propagated by seeds, which must be procured as fresh as possible, from the islands where the plants grow naturally. These should be sown in the spring, upon a good hot-bed, and when the plants are fit to remove, they should be planted each in a separate small pot, and plunged into a hot-bed of tanner's bark, observing to shade them from the sun till they have taken new root, after which, when the weather is warm you must admit the fresh air. In summer they must frequently be

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refreshed with a little water, keeping them always in the tan-bed of the stove.

CEDAR of Carolina, Bermudas, and Lycia, all different species of the Juniper. See the article JUNIPER.

CELERY, a species of the Parsley or Apium, of which there are two sorts distinguished by the names of the Italian Celery, and the Celeriac.

Culture of the CELERY.

The seeds of these plants should be sown at two or three different times, the better to continue them for use during the whole season, without their coming up to seed. The first sowing should be in the beginning of March, upon a gentle hot-bed; the second may be at the end of the same month; in an open spot of light earth, where it may enjoy the benefit of the sun; the third time of sowing should be the latter end of April, or beginning of May on a moist soil; and if exposed to the morning sun only, it will be of great advantage to the plants, and it never should be under the drip of trees.

In about a month after sowing, the plants will come up; they must be kept clear from weeds, and if the season is dry they must be watered. When they have been a month or five weeks above ground they will be fit to transplant. Set them at three inches distance, in beds of moist, rich earth. The middle of May some of the plants of the first sowing will be fit to transplant for blanching; the soil in which they are now to be planted must be moist, rich, and light. The manner of planting them at this time is as follows: dig a trench of ten inches wide, and eight or nine inches deep, loosening the earth at the bottom, and laying it level; the earth which is dug out of the trench must be equally laid on each side of the trench, to be ready to draw in again to earth the Celery as it advances in height. The trenches should be made three feet asunder, and the plants set in them at six inches distance. Before you plant them you must trim their roots and cut off the tops of the long leaves, and as they are planted you must observe to close the earth well to their roots with your feet, and to water them plentifully until they have taken new root: after this they require little care but the drawing up the earth to them as they advance in height: great care must however be observed in doing this, never to bury the heart of the plant, nor ever to perform it but in dry weather; for if done in wet the plants will rot.

When the plants are advanced a considerable height above the trenches, and all the earth which was laid on the sides has been employed in earthing them up, you must then with a spade dig up the earth between the trenches, which must be used for the same purpose, continuing from time to time earthing it up, till they are fit for use.

About the latter end of June some of the first planting will be fit to cut, and the succeeding ones if properly managed, will continue till April or May, but you should observe to plant the last crop in a dry soil, to prevent its being rotted with too much wet in winter. When the frost is very hard cover the ridges of Celery with some pease-haulm, or some such light covering which will admit the air to the plants, and at the same time keep them warm, for if they are covered too close, they will be very subject to rot, but this covering must be taken off whenever the weather will permit, otherwise it will cause the Celery to pipe and run to seed. By this method the frost will be kept out of the ground, and the Celery may always be drawn for use when wanted, but if neglected, cannot be taken up in hard frost. Many plantations may be made of one sowing, if care is taken to pull up the strongest plants first, then some time after the strongest of the remaining, and finally the least of all, which will be got to a proper growth by that time.

The other sort of Celery which is commonly called Celeriac, is to be managed in the same manner as is directed for the Italian Celery, excepting that it should be planted upon the level ground, or in very shallow drills,

drills, for as this plant seldom grows above eight or ten inches high, it requires but little earthing up. The great excellency of this consists in the size of the root, which is often as large as an ordinary turnep. It should be sown the latter end of March upon a border of rich earth, and constantly watered in dry weather, otherwise the seeds will not grow: when the plants are large enough to transplant, they should be placed eighteen inches asunder, row from row, and the plants six or eight inches distant in the rows: the ground must be carefully kept clean from weeds; but this sort will require only one earthing up, which should not be performed till the roots are nearly grown to their size.

The best method of saving the seed of the Celery is to make choice of some long good roots, which have not been too much blanched; early in spring plant them out in a moist soil, at about a foot and a half asunder; and when they run up to seed, keep them supported with stakes to prevent their being broke down by the wind. In July when the seed begins to form, if the season should prove very dry it will be proper to water the plants, which will greatly help their producing good seeds. In August these seeds will be ripe. Choose a dry day for cutting up the plants, spread them upon cloths in the sun to dry, then beat out the seed, and preserve it in bags for use.

CELLS of Plants, the hollow places between the partitions in the pods, husks, and other seed-vessels of plants. According as there is one, two, three, &c. of these cells, the vessel is said to be unilocular, bilocular, trilocular, &c.

CENTAURY, a genus of plants ranged by Linnæus among the *syngenesia polygamia*, and of which there are too many species to be enumerated in this work.

Evergreen CENTAURY. This is an elegant plant, the stalk is about five feet high, firm and full of branches; the leaves have no footstalk, they are long, narrow, lanceolated, and of a pale green. The flowers stand in scaly heads at the tops of all the branches, they rise on short leafy footstalks from the bosoms of the upper leaves, are large and of a dusky red.

Culture of this CENTAURY.

The method of raising this plant is from seeds, these ripen very well with us: in the beginning of April sow these on an open spot of ground: when the young plants come up they must be weeded, and at times watered; when they are three inches high, they must be transplanted into another bed in the nursery, allowing them a foot space asunder.

In the latter end of September they must be removed into the garden, and placed where they are to remain. They must be taken up with a large ball of earth about the roots, and a hole opened for their reception. They should be allowed the distance of a yard from each other, and the ground about them kept clean from weeds, when too dry they should be constantly refreshed with a little water. Thus they will flower all the succeeding summer, till late in autumn, with great profusion. To promote this, the flowers should be nipped off as soon as their beauty is past; except a few which must be left for seed.

They should be raised anew from the seeds every two or three years, for the plants flower much more elegantly the second or third season than afterwards.

CHAMOMILE, *Anthemis*, a genus of plants classed by Linnæus among the *syngenesia polygamia superflua*, and of which there are a number of species, mostly propagated in botanic gardens for medicinal uses.

Culture of the CHAMOMILE.

These plants are all propagated either by seeds or slips; if by seeds they should be sown in the spring, upon poor land, where the plants will continue much longer than in good ground. The slips may be planted during any of the summer months, observing to set them in a shady border, and water them until they have taken root. In the autumn they may be removed to the places where they are to remain, and will require no other care than to be kept clean from weeds. These plants do not grow tall, but are bushy, so should be allowed room.

CHARVIL, *Chærophyllum*, a genus of plants ranged by Linnæus among the *pentandria digynia*, and of which there are six species, but one only is cultivated in our gardens.

Culture of the Garden CHARVIL.

It is propagated by seeds which should be sown in autumn, soon after they are ripe, for those which are sown in spring seldom come up, and if they do the plants are always bad, for when the warm weather sets in, they wither and decay, but the plants which rise in autumn, continue green all the winter, and in April, they flower, soon after which the seeds ripen and the whole plants decay. It requires no particular care in the culture as the plants will thrive in any soil, or situation.

CHASTE-TREE, *Vitex*, a genus of plants classed by Linnæus among the *didynamia angiospermia*, and of which there are four species. 1. Chaste-tree with fingered leaves, and whorled spikes of flowers, or common Chaste-tree. 2. Chaste-tree with fingered, sawed leaves, and spikes in panicles. 3. Chaste-tree with trifoliate and quinate leaves, and panicles of flowers rising from the division of the branches. 4. Chaste-tree with ternate and quinate leaves, which are cut like wings, and whorled spikes of flowers terminating the branches.

The first sort grows naturally in Sicily, near Naples, and in moist places in the Archipelago. It has a shrubby stalk which rises to the height of ten or twelve feet, sending out branches opposite the whole length, they are garnished with leaves of a dark green on their upper side but hoary on their under. The flowers are produced in spikes at the extremity of the branches, their colour is sometimes white, and sometimes blue, these are generally late before they appear; they have an agreeable odour, and make an elegant appearance in autumn, when most other shrubs have done flowering.

The second species is a native of Italy, and the south of France, it is a lower shrub than the former, seldom rising more than five feet high. The flowers come out in panicked spikes toward the end of the branches; they are blue, and appear sooner than those of the first sort, but they are not so large.

The third sort is a native of both Indies; it rises to the height of nine, and sometimes ten feet. The flowers are small, and white, and disposed in panicles, which rise at the division of the branches.

The fourth species grows naturally in the northern parts of China, where it rises to the height of eight or ten feet. The leaves are of a dark green on their upper side, but grey on the under. The flowers are disposed in whorled spikes, which come out opposite to the wings of the stalk; these are blue, and about the size of those of the first.

Culture of the CHASTE-TREE.

The first and second species are very hardy, they may be propagated by planting their cuttings early in the spring before they shoot; they require a fresh, light soil, and must be frequently refreshed with water until they have taken root; after which they must be carefully cleared from weeds during the summer season, and if the following winter proves severe it will be proper to lay a little mulch on the surface of the ground between the plants to prevent the frost from penetrating to their roots, which, while young, would injure them, and as these cuttings are apt to shoot late in the year, their tops will be very tender, and the early frosts in autumn often kill them down a considerable length, for which reason they must be covered with mats which will be of great service to them. Toward the middle of March, if the season is favourable, they should be transplanted either into the places where they are designed to remain, or into a nursery where they may grow two or three years to get strength; here they must be pruned up, in order to form them into regular stalks, otherwise they are very subject to shoot out their branches in a straggling manner.

The third sort is propagated both by cuttings and layers. The cuttings must be planted in pots, and plunged

plunged into a moderate hot-bed, cover them close with a bell or hand-glass, to exclude the air; they must be refreshed with water at times, but it must be given them in small quantities. The best time to plant the cuttings, is about the middle or latter end of April; for if they succeed, they will put out roots in six or seven weeks, and will then begin to shoot: therefore they should have the free air admitted to them gradually, to prevent their shooting weak: then they may be carefully taken up, and each planted in a separate small pot, filled with light earth, and plunged into the hot-bed again, shading them from the sun till they have taken new root, after which, when the weather is good, let them have plenty of free air, and treat them in the same manner as other tender plants. In winter they must be kept in a moderate temperature of heat, and in summer have all the air that can possibly be admitted to them, but not removed into it openly.

The fourth sort is propagated by cuttings, which, in spring, must be planted in pots, and plunged into a moderate hot-bed; and when the cuttings are well rooted, they should be carefully taken up, and each planted into a separate small pot, filled with light earth, and placed in the shade till they have taken fresh root: then they may be removed to a sheltered situation, and placed with other green-house plants, where they may remain all the summer; but in autumn they must be placed under shelter, for they will not bear the cold of our climate. The plants are late in putting out new leaves in the spring, and, before these appear, they have so much the appearance of dead plants, that they have been turned out of the pots by some, supposing they were really so.

CHELONE, a genus of plants, for which there is no English name; it is ranged by Linnæus among the *didymia angiospermia*; and there are three species of it. 1. Chelone, with spear-shaped, sawed leaves, and the upper ones placed opposite. 2. Chelone, with the stalk and leaves hairy. 3. Chelone, with the leaves embracing the stalk, and a dichotomous panicle.

Culture of the CHELONE.

They are all natives of North-America, have perennial roots, and flower in August. If the season proves favourable, they will ripen their seeds here; but as the plants propagate very fast by their creeping roots, the seeds are seldom regarded. If they are transplanted in spring, it should not be later than the middle of March: but the best time for doing this is in autumn; they will thrive in almost any soil or situation.

Their roots are apt to creep too far if not confined, therefore the best method is to plant them in pots. They should have plenty of water in hot weather.

CHERRY-TREE, *Cerasus*, according to Linnæus a species of the *Prunus*, but a distinct genus according to other authors, and of which there are five species.

1. The common, or Kentish Cherry. 2. Cherry-Tree, with spear-shaped sawed leaves, or Black Cherry. 3. Cherry-Tree, with oval spear-shaped leaves, and flowers growing in clusters, commonly called the Cluster Cherry. 4. Cherry-Tree, with flowers growing in round bunches, and oval leaves, called the Mahaleb, or Perfumed Cherry. 5. Cherry-Tree, with smooth spear-shaped entire leaves, of a bluish green on their under-side, and spreading branches.

The first sort is the common, or Kentish Cherry, and which is too well known to stand in need of any description here; from this, it is supposed the following sorts have been raised.

The Early May Cherry, the May Duke Cherry, the Archduke Cherry, the Flemish Cherry, the Red-Heart, the White-Heart, the Black-Heart, the Amber-Heart, the Ox-Heart, the Lukeward, the Carnation, the Hertfordshire-Heart, the Morello, the Bleeding-Heart, and the Yellow Spanish Cherry.

The Black Cherry is supposed to be a native of England: this grows to be a large tree, fit for timber; there are only two varieties of it, the Black Coroun, and the small Wild Cherry; the stones of this sort are

generally sown for raising stocks to graft or bud the other sorts of Cherries upon.

Culture of the CHERRY-TREE.

All the sorts of Cherries which are usually cultivated in gardens, are propagated by inoculation or grafting the several kinds into stocks of the Black or Wild red Cherries, which are strong shooters, and of longer duration than any of the garden kinds; the stones of these two sorts are sown in autumn on a bed of light sandy earth, and the young stocks produced from them are to remain where they rise, till the second autumn after their sowing; then, in October, they should be planted out into a rich soil, allowing three feet distance from row to row, and about one foot in the rows. The second year after the planting out, they will be fit to bud, if they are intended for dwarfs; but if they are intended for standards, they will not be tall enough till the fourth year; for they should be budded, or grafted, near six feet from the ground. The grafting is usually performed in the summer, and the head of the stock is to be cut off in the beginning of the March following, about six inches above the bud; if the bud has shot well, and there is any fear of its being displaced by winds, it must be gently tied up to the part of the stock left above it. The autumn afterwards, these trees will be fit to remove, and be left where they are to remain; or they may be left till the next year. Lopping off part of the heads of these trees, when they are planted in their places, is a very bad method, it often kills them, and if they escape they seldom recover it for four or five years.

If the trees are intended for walls, it is advisable to plant dwarfs between the standards, that these may cover the lower part of the wall, while the others spread over the upper part; and when the dwarfs rise to fill the walls, the standards should be taken entirely away. When these trees are taken up from the nursery, the dead fibres of the roots must be carefully taken off, and the upper part of the stock, which is above the bud, must be cut off close down to the back part of it; observe to place the bud directly from the wall.

Cherry-trees thrive best on a dry, hazely loam. In a gravelly soil they are very subject to blights, and seldom stand long good.

Your trees, if planted against a wall, should be placed at least twenty, or twenty-four feet asunder, with a standard-tree between each dwarf.

In pruning these trees, their shoots should never be shortened, for they mostly produce their fruit from their extreme part. All the fore-right shoots are to be displaced, and the others trained horizontally; and where there is a vacancy in the wall, the branches being shortened, will throw up a shoot or two to fill it.

CHERRY-LAUREL, according to Linnæus a species of the *Cerasus*, but other authors have considered it as a species of the *Padus*.

Culture of the CHERRY-LAUREL.

There are several sorts of this species cultivated in the gardens about London; they are all propagated by sowing the berries, or by laying down the tender branches, which in a year's time will take root; they may then be transplanted into beds for a year or two, or placed at once where they are to remain. If they are to be raised by sowing, the berries must be gathered when ripe, which is in January, and kept in dry sand till the beginning of March; then sow them in a bed of rich, dry earth, well sheltered from the north and east winds. The bed must be levelled, and furrows made along it of an inch deep, at eight inches distance; drop the berries into these, about two inches asunder, and cover them with earth; if the season proves very dry, they must be watered: in about two months they will come up; let them remain in this bed for two years: then, in April, transplant them into a bed of earth well dug, allow them eighteen inches distance from each other, water them well, and cover their roots with mulch. Tye them to stakes, in order to train them up strait, and prune off their under shoots, which will make them advance in height greatly.

Barbadoes CHERRY, *Malpighia*, a genus of plants, of which there are eight species. 1. Barbadoes Cherry, with smooth, oval, entire leaves, and umbellated foot-stalks. 2. Barbadoes Cherry, with the appearance of the Pomegranate-tree. 3. Barbadoes Cherry, with spear-shaped leaves, hoary on their under side, and umbellated foot-stalks proceeding from the wings of the stalk. 4. Barbadoes Cherry, with spines growing on the under side of the leaf. 5. Barbadoes Cherry, with oval, smooth, acute-pointed leaves, and umbellated foot-stalks proceeding from the sides and ends of the branches. 6. Barbadoes Cherry, with linear spear-shaped leaves, rigid declining bristles, and foot-stalks, having flowers proceeding from the sides of the branches in clusters. 7. Barbadoes Cherry, with spear-shaped leaves, indented and prickly, whose under sides are set with spiny hairs. 8. Barbadoes Cherry, with leaves nearly oval, indented and prickly, and foot-stalks with one flower.

All these plants are natives of the warmest parts of America; the first sort is cultivated in the West-Indies for the sake of its fruit, which is very indifferent, but it has a pleasant acid flavour, that renders it agreeable to the inhabitants of those warm countries.

Culture of the Barbadoes CHERRY.

All the species are propagated by seeds, which must be sown upon a good hot-bed.

When they are fit to transplant, put them each into a separate small pot, and plunge them into the bark-bed of the stove, where it will be proper to keep them the two first winters, and afterwards in winter they may be placed upon stands in the dry-stove, where they may be kept in a temperate warmth; they will thrive here much better than in a greater heat. When they are placed in the dry stove, they must be watered two or three times a week, but it must be given them in small quantities.

Cornelian CHERRY, a species of the *Cornus*, and the only one cultivated in gardens; ranged by Linnæus among the *tetandria monogynia*. It was formerly very common in our gardens, where it was propagated for its fruit, which, when preserved, made good tarts, but at present it is only cultivated as a flowering shrub. There is no great beauty in the flowers, but as they are generally produced in plenty by the beginning of February, a season when few other flowers appear, they are worthy a place in gardens for the sake of variety.

Culture of the Cornelian CHERRY.

This plant is propagated by seeds, which should be sown in autumn, soon after they are ripe; in the spring following the plants will appear, when they should be watered and weeded. In the autumn following they must be removed, and planted in beds in the nursery, where they may remain two years, by which time they will be fit to remove to the places where they are designed to stand. These plants are also propagated by suckers and laying down of the branches; they require no particular management different from the seedling plants.

Winter CHERRY, *Physalis*, a genus of plants ranged by Linnæus among the *pentandria monogynia*, and of which there are nine species. 1. Winter Cherry with a shrubby stalk, erect branches, and flowers growing in clusters. 2. Winter Cherry with a shrubby stalk, flexible branches, and flowers growing in clusters. 3. Winter Cherry with a shrubby stalk, and oval woolly leaves. 4. Winter Cherry with heart-shaped, entire, obtuse, rough leaves, and smooth petals. 5. Winter Cherry with two leaves at a joint. 6. Winter Cherry with angular smooth branches. 7. Winter Cherry with hairy, viscous leaves, and nodding foot-stalks. 8. Winter Cherry with fruit bearing footstalks, longer than the leaf. 9. Winter Cherry with farinaceous, germinating divarications.

Culture of the Winter CHERRY.

The five first species are perennial plants. The first grows naturally in Mexico, Crete, and Spain, and is propagated by seeds, which, in the beginning of April, should be sown on a bed of light earth. When the

plants are two or three inches high, they should be carefully taken up, and each planted in a separate small pot, filled with earth out of a kitchen garden, and placed in the shade till they have taken new root, they should then be removed to a sheltered situation, where they may remain till the beginning of October, when they must be removed into the green-house, and treated like other green-house plants.

The second species is also propagated by seeds, which should be sown upon a moderate hot-bed. When the plants have four leaves, they should be transplanted on a fresh hot-bed, and shaded from the sun till they have taken new root, they should then have fresh air admitted to them in mild weather and be treated like other exotic plants. When these are grown three or four inches, they should be transplanted each into a separate small pot, filled with light, loamy earth, and placed in a frame upon an old hot-bed, shading them from the sun till they have taken new root. Then inure them gradually to bear the open air, into which they may be removed in July and placed in a warm situation; here they may remain till the end of September, when they should be taken into shelter, and the first winter placed in a moderate stove; but when the plants have got strength, they will live through the winter in a good green-house.

The third species is a native of Curassao, and may be propagated by cuttings, which must be planted in small pots, filled with light, loamy earth, and plunged into a moderate hot-bed; care must be taken to shade them from the sun till they have taken root; after which they should be hardened by degrees, and, about the beginning of July, removed into the open air, in a sheltered situation.

When they have obtained strength, let them be planted each in a distinct pot, and afterwards treated as was directed for the last species; this sort seldom ripens seeds in England.

The fourth species is a native of Buenos Ayres, and is easily propagated by parting of the roots, either in spring or autumn, planting them in pots in winter; they must be sheltered under a hot-bed frame, from whence the plants may enjoy the free air in mild weather.

The fifth sort is a native of India, and is propagated either by seeds or by parting of the roots: it requires a shady situation.

The sixth, seventh, eighth, and ninth species are annual plants, and natives of both Indies: they are propagated by seeds, which should be sown on a moderate hot-bed: when the plants are a little advanced, they should be planted on a fresh hot-bed, to bring them forward; when they are grown strong, let them be inured to the open air, and afterwards transplanted, with balls of earth to their roots, into a warm border, and water them gently till they have taken root; after which they will require no other care than being kept clear from weeds.

Double-blossomed CHERRY, a species of the *Cerasus*.

This is a most elegant variety of the common kind of Cherry. The tree will rise to a considerable height, but it is better kept to an under growth, with a full head, that its flowers may stand close, and give their beauty distinctly to the eye. They are double in a various degree: in some there are only three rows of petals; in others the series are much more numerous, and the flower so full that it becomes globular. This is the most elegant state. The colour is a perfect white; and when the full head of a small standard is profusely covered with them, it appears at some distance a ball of snow; and the nearer it is viewed the more it charms.

Each flower stands on its own footstalk, which is tender and of a pale green, stained with red. Many of these rise together, and the whole cluster is very beautiful.

No fruit follows, by chance a Cherry may be left on a bough, but this seldom happens.

Culture of the Double-blossomed CHERRY.

The propagation of the Double-blossomed Cherry must be by budding, or inoculating upon the common wild red Cherry stock. Some use the black Cherry stock for this purpose, but it is a wrong practice, for it is too strong a shooter; and experience has shewn that the red Cherry stock is more durable than the black. With good management, a budded stock of this will form, in a few years, a well-headed tree which will last a considerable length of time. These stocks are to be raised in a nursery bed from kernels; and when they have been two years planted out they will be fit to inoculate. See INOCULATION.

CHESNUT-TREE, *Castanea*, according to Linnæus a species of the *Fagus*, but by other authors considered as a distinct genus. The above writer has ranged it among the *monoecia polyandria*; there are three species of it. 1. The manured Chesnut. 2. Chesnut with oval, spear-shaped leaves sharply sawed, which are woolly on their under side, and a slender knotted catkin. 3. Chesnut with oblong, oval, sawed leaves, and a very large, round, prickly fruit.

The Chesnut is a tree as worthy our care and attention as any tree propagated in this country, either for its use or beauty. It is one of the best sort of timber, and affords an excellent shade. It grows to a very great size and spreads its branches freely on every side where it has room.

Culture of the CHESNUT-TREE.

The Chesnut-tree is propagated by planting the nuts in February, in beds of fresh undunged earth. The best nuts for sowing are those brought from Portugal and Spain. But when these cannot be obtained good, it will be better to make use of the nuts which have been ripened here, which are nearly equal in goodness, only much smaller; these however are quite as proper to sow, when the tree is designed either for timber or beauty, as the foreign nuts.

They may be raised either in nurseries or in the places where they are to stand. If in the nursery it should be chosen upon poor ground, and, about the middle of February, trenches should be opened, four inches deep and six inches asunder. In these the Chesnuts should be placed regularly, one at the distance of every four inches, with the eye laid uppermost; and the earth drawn over them. Six of these trenches should be made, and then a space left, wide enough to get between to clean them; then another bed of six rows, thus proceeding till a sufficient quantity is planted. In about two months the plants will appear, they should be kept clear from weeds. Let them stand here two years, at the end of which time take them up, and plant them at two feet distance, in rows, a yard asunder; the long top-root is to be cut off, and care taken not to injure the other roots.

The best time for transplanting them is early in March, and care must be taken to trim off their side shoots, which will be a means of making them grow upright and strait. After they have stood four years in this place they may be removed to the places where they are designed to remain.

When you first finish your plantation, you must be careful that it is not destroyed by mice, and other vermin, which is often the case; the best method of preventing which, is to set traps in different parts of the ground.

Horse CHESNUT, *Æsculus*, a genus of plants, classed by Linnæus among the *heptandria monogynia*, and of which there is but one species.

This tree was in much greater esteem formerly than at present; the reason of its being so seldom planted now, is because the leaves decay early in summer, for they frequently begin to fall in July, and occasion a litter from that time till the leaves are all off; but notwithstanding this inconvenience, the tree has great merit, for it affords an excellent shade in summer, and during the month of May, no tree has a greater claim to beauty, for the extremity of the branches are terminated by fine spikes of flowers, which are elegantly

spotted with a rose colour, and these being intermixed with the green leaves, make a noble appearance.

Culture of the Horse CHESNUT.

This tree is propagated by sowing the nuts early in the spring, and if they are well preserved in sand during the winter, the plants will shoot near a foot the first summer. If they grow close together, it will be proper to transplant them the autumn following, when they should be planted in rows at three feet distance, and one foot and a half asunder in the rows.

Here let them stand two years, by which time they will be fit to plant where they are designed to remain; they must be well staked to prevent their being displaced by strong winds, and should also have a fence round them, to secure them from cattle.

When these trees are transplanted, their roots should be preserved as entire as possible, for they do not succeed well when torn or cut; nor should any of the branches be shortened; for there is scarce any tree which will not bear amputation better than this; therefore, when any branches are by accident broke, they should be cut off close to the stem, that the wound may heal over.

Scarlet-Flowering Horse CHESNUT, *Pavia*, according to Linnæus, a species of the *Æsculus*, but a distinct genus according to other authors.

This plant grows naturally in Carolina and the Brazils; it seldom rises higher than eight or ten feet. The flowers are produced in loose spikes at the end of the branches, and are of a bright red colour.

Culture of the Scarlet-Flowering Horse CHESNUT.

It may be propagated by sowing the seeds in the spring upon a border of light sandy earth. When the plants come up, they should be carefully weeded, and transplanted the year following. In autumn, when the early frosts begin, they should be covered with mats, and be thus sheltered for two or three winters, till they have obtained strength to resist the frost. They should be removed just before they begin to shoot, and be placed either in a nursery to be trained up, or where they are designed to remain, observing, if the season is dry, to water them till they have taken root, and likewise to lay some mulch upon the surface of the ground, to prevent its drying too fast. As the plants advance, the lateral branches should be pruned off, in order to reduce them to regular stems, and the ground should be dug about their roots every spring.

This tree may also be propagated by budding, or inoculating it upon the common, or Horse-Chesnut, but this is a very bad method, and the trees thus raised never make a good appearance long together, for the common Chesnut will be twice the size of the other, and frequently put out shoots below the graft.

CHIVES, an English name for the stamina, or male organs of generation in plants. See the article STAMINA.

CHRISTMAS-ROSE, a species of the Hellebore. See HELLEBORE.

Herb CHRISTOPHER. See BANEERRIES.

CHRYSANTHEMUM, *Corn-Marigold*, a genus of plants, ranged by Linnæus among the *syngenesia polygynia superflua*, and of which there are a number of species, many of them never admitted into gardens; for those that are, the culture of the Candy Chrysanthemum, which is the most beautiful of all these species, will be a sufficient direction.

This is a very elegant plant; the root is long, white, and furnished with numerous thick fibres; the stalk is round, firm, upright, of a pale green, broke into many branches, and lightly hollow in the centre. The leaves are very beautiful, standing without order, in great numbers; their colour is a greyish green, and they are divided in a most elegant manner into numerous serrated segments. The flowers terminate the branches, they rise on small leafy stalks from the bosom of the leaves: their colour, when they first open, is a deep yellow, which by degrees grows paler, and they have in the centre a yellow disk.

This

This is the natural and simple state of the flower ; but culture will make them double in various forms, and quill the leaves as elegantly as in the best flowers of African Marigolds.

Culture of the Candy CHRYSANTHEMUM.

Let good seeds be saved from quilled or double flowers of the best sort ; spread them upon a shelf in an airy room, till they are gently hardened, and then put them by till spring. Early in the season let them be sown upon a good hot-bed ; and brought forward with the usual care. Where they rise very thick pull up a few of the weakest ; and when the rest by gentle waterings have been brought to due strength for removing, transplant them to another hot-bed. On this they are to be brought forward by the same care, shading and watering them gently till they have taken root ; and afterwards encouraging them by sun and air. From this second they are to be removed to a third hot-bed, and treated in the same manner as in the former till they are well rooted : then they must have more air by degrees ; and when they have grown so as to fill the frame, then they must be planted out before they are stunted by the covers. The summer will by this time be so well advanced, that they may, without danger, be allowed the full air. Let holes be opened for them in proper parts of the border, where the mould is very fine ; and bring them carefully thither with a large ball of the hot-bed mould about their roots. In each of the places where one plant is intended to stand for flowering, let two holes be opened, at a small distance from one another ; and one plant from the hot-bed set in each ; they must be gently watered from time to time in an evening.

In a few weeks they will begin to shew their buds for flowering, and the gardener must carefully watch their first opening. The seeds of double flowers do not at all times produce double-flowered plants, though it is a good chance that there will be many. Let provision be made at this time for such as are single, and also for one of the two when both appear double ; for only one is intended to remain in a place. For this purpose let holes be opened at proper distances in some of the wildest parts of the garden, among thickets, and in the borders of a court-yard, and fill some pots with the richest of the garden soil. When one of the two plants appears to have single flowers, let it be carefully taken up and planted in the holes opened for that purpose, in the places just named ; and where both are double, let one of them be taken up with the utmost care, and planted in a pot. They will now begin to flower, and there will be three distinct sets of plants, though from the same seeds, these in the wild places will grow to a great bigness, and spread every way in a pleasing irregularity. Their flowers will be extremely numerous, and of a fine strong colour.

The second sort will be those which remain in the borders : these will be large and very finely covered with double flowers ; some of the quilled, and others of the plain kind.

The third sort is those in pots. These will differ from the others in their being smaller ; but they will naturally have more and larger flowers. These may also be preserved longer by being brought into shelter ; and thus will be obtained the finest kinds. Let the seeds for a succeeding year be saved from the finest and best of these, the largest flowers of the quilled kind, and there will need no farther care about them.

Bastard CHRYSANTHEMUM, Silphium, a genus of plants ranged by Linnæus among the *syngenesia polygamia necessaria*, and of which there are five species. 1. Bastard Chrysanthemum, with alternate, winged, sinuated leaves. 2. Bastard Chrysanthemum, with undivided, sessile leaves, growing opposite one to the other, and the lower leaves alternate. 3. Bastard Chrysanthemum with sawed leaves, upon footstalks, growing opposite to each other. 4. Bastard Chrysanthemum with spear-shaped, acutely sawed leaves, upon footstalks, growing opposite to each other. 5. Bastard Chrysanthemum with trifoliate leaves.

Culture of the Bastard CHRYSANTHEMUM.

The plants are all natives of North America, and are propagated by parting of the roots in autumn, after the stalks begin to decay ; they require no particular management ; but succeed best in a dry soil, and a shady situation.

Hard-seeded CHRYSANTHEMUM, Osteospermum. Of this genus there are four species. 1. Hard-seeded Chrysanthemum with palmated leaves growing opposite each other. 2. Hard-seeded Chrysanthemum with branching spines. 3. Hard-seeded Chrysanthemum with oval, serrated leaves. 4. Hard-seeded Chrysanthemum with spear-shaped, imbricated leaves, sitting close to the stalk.

Culture of the Hard-seeded CHRYSANTHEMUM.

These are shrubby plants, the first species is a native of Virginia, and as it never produces seeds in England, is generally propagated by parting of the roots, which should be done in the month of October. They must be planted in a light rich soil, and a moist situation ; the seeds, when procured from America, should be sown on a bed of rich earth, and watered in dry weather.

The second, third, and fourth species are natives of Africa, and are too tender to bear the open air of our climate. Therefore in the month of October, they should be placed in the green-house, and treated like other hardy green-house plants, which require a large share of air in mild weather. About the beginning of May, the plants should be removed into the open air, and placed in a sheltered situation, during the summer season, when they should also have plenty of water.

They may likewise be propagated by cuttings planted in any of the summer months, upon a bed of light earth ; they should be watered and shaded till they have taken root ; after which they must be planted in pots.

CINAMON-TREE, a species of the *Laurus* or Bay-tree. See the article **BAY-TREE**.

CINQUEFOIL, *Potentilla*, a genus of plants ranged by Linnæus among the *icosandria polygynia*, and of which there are a number of species, but six only are propagated in gardens. 1. Cinquefoil with winged leaves, and a shrubby stalk, commonly called shrubby Cinquefoil. 2. Cinquefoil with alternate, winged leaves, having five oval, crenated lobes, and an erect stalk. 3. Cinquefoil with finger-shaped, sawed leaves, hairy on both sides and an erect stalk. 4. Cinquefoil with five wedge-shaped, cut leaves, woolly on their under side, and an erect stalk. 5. Cinquefoil with finger-shaped leaves, sawed at the points, very slender, trailing stalks, and hairy receptacles. 6. Cinquefoil with trifoliate leaves, and an upright branching stalk, and footstalks rising above the joints.

Culture of the CINQUEFOIL.

The first species is a native of the northern counties of England, and of several countries in the north parts of Europe, and is propagated by suckers, or by laying down the tender branches, which, after they have taken root, may be cut off from the old plant, and planted in a nursery for a year or two, before they are set in the places where they are designed to remain.

This sort may also be propagated by cuttings, which in autumn should be planted in a shady border, and the autumn following transplanted into the nursery ; they should have a shady situation, and a cool moist soil.

The second species is a native of many parts of Europe, and is propagated by sowing the seeds, or parting the roots in autumn, and will succeed best in a moist soil, and a shady situation.

The third species grows naturally in France and Italy. It is an annual plant, and may be propagated by seeds, in the same manner as the second sort.

The fourth species is a native of the hilly parts of Europe ; it is a perennial plant, and is propagated by parting the roots, as was directed for the second sort.

The fifth is a native of the south parts of Germany, and has a perennial root ; it is propagated by runners, which should be transplanted in autumn ; it requires the same soil as the rest.

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The sixth sort grows naturally in the south of France; it is an annual plant, and may be propagated by sowing the seeds, and will require no other care than keeping the plants free from weeds.

CION, or GRAFT. See the article **GRAFT**.

CIRCULATION of the Sap in vegetables. See the article **SAP**.

CIRRHUS, among botanists, expresses a little fibre, which plants send out from their stalks, and by which they are attached to other bodies.

CISTUS, a genus of plants, which according to Linnæus comprehends the Cistus, strictly so called, or the Rock-Rose, and the Helianthemum, or Dwarf Cistus, commonly called the Sun-Flower; but other authors have considered them as two distinct genera. The above writer has ranged them among the *polyandria monogynia*.

Spotted CISTUS, or **ROCK-ROSE**. This is a shrub of very singular beauty, and is valuable for the long time it continues flowering; it rises to the height of seven feet, the stem is woody, and the bark is blackish. The young shoots are slender, and of a glossy purple. The leaves are placed irregularly, they are long, narrow, waved at the edges, of a deep green above, and white beneath. When the plant is in full perfection, those toward the top are covered with a transparent fragrant resin.

The flower is large, and naturally of a delicate white, but sometimes it is stained toward the edges with red, and sometimes red entirely.

Culture of the SPOTTED CISTUS.

The culture of this plant is easy; it will stand our winters in a well chosen situation, and adds greatly to the beauty of our plantations of the hardy shrubs.

It may be raised by cuttings; but the best and surest method of having handsome shrubs, is to raise them from the seed. In the last week in March prepare a moderate hot-bed, cover it four inches deep with pure mould, without any mixture, and in this sow the seed; cover them an inch deep, and just sprinkle the bed with water when they are in; here let them stand till they are four inches high, giving them air at times; and when they have attained this height, prepare a bed for them in the following manner.

In a warm quarter of the seminary dig a trench a foot deep, and three feet wide; fill it with fresh cut grass, and tread it down. Mix three loads of good mould with one of burnt turf, work them well together, and with this compost cover the grass: let the bed rise a foot and a half above the surface, and spread each way a foot beyond the outline of the trench; on this bed draw three lines lengthways at equal distances, and at every eighteen inches open a small hole; into each of these holes put a plant of Cistus; cover it carefully, and settle the ground by a gentle watering. Keep the bed clear from weeds, and often water the plants slightly.

Thus let them stand open till winter: then defend the bed by a reed fence at each end, and furze bushes before and behind, stuck up dry, and about two feet high: thus leave them the winter; if it be severe some of them will perish, but the remainder will be too hardy for all succeeding dangers. In the April following mark out the places where they are to stand, and dig large holes for them. Break the earth well about the holes, and into each put a plant.

Chuse a dripping day for this, it will be the last trouble they will require, but should be done carefully. Thus by the assistance of a few waterings they will take root. The care is now to train them, which is very easy; they naturally rise with an erect trunk, which at about two feet high spreads into branches.

The irregular shoots must be taken off, and the rest favoured; and thus it is impossible to miss of having handsome, hearty shrubs. A dry part of the garden is best for them, and they should be sheltered from the north and east.

It is a wrong method in those who cramp this species in pots, or smother it in a green-house: for thus its flowers are few and weak, and always of a dead white;

but let its roots have their full and free scope of ground, and give the plants air, and they will open by thousands; the petals will be tinged with a fleshy purple, and their spots will glow.

Dwarf CISTUS. See the article **SUN-FLOWER**.

CITRON-TREE, *Citrus*, which according to Linnæus comprehends the Aurantium, or Orange-Tree, the Citrus, strictly so called, or Citron-Tree, and the Lemon, or Lemon-Tree, but by other authors considered as three distinct genera. Linnæus has ranged it among the *polyadelphia icofandria*.

Of the Citron-Tree there are two species. 1. Citron, with a larger, oblong, pointed fruit, having a thick rough rind, or Sweet Citron. 2. The Common Citron.

There are several other varieties of this fruit, with which the English gardens have been supplied from Genoa, where is the great nursery for the several parts of Europe for this sort, as also for Orange and Lemon-Trees.

Culture of the CITRON-TREE.

For this we shall refer our readers principally to the culture of the Orange-Tree, only observing here that the Citron is of a tenderer nature than the Orange, and should therefore have a warmer situation in winter; they should also continue a little time longer in the house in the spring, and be carried in again sooner in the autumn; and as their leaves are larger, and their shoots stronger than those of the Orange, they require a little more water in the summer; but in winter they should have very little water at a time which must be the oftener repeated.

The common Citron is much the best stock to bud, or inoculate any of the Orange or Lemon kinds upon, it being the straightest and freest growing tree; the rind is smoother, and the wood less knotty than either the Orange or Lemon, and will take either sort full as well as its own kind, which is what none of the other sorts will do: and these stocks, if rightly managed, will be very strong the second year after sowing; capable to receive any buds, and will force them out vigorously; whereas it often happens, when these buds are inoculated into weak stocks, they frequently die, or remain till the second year before they put out; and those that shoot the next year after budding, are oftentimes so weak as hardly to be fit to remain, being incapable to make a straight handsome stem, which is the great beauty of these trees.

CLARY, *Sclarea*, a genus of plants, ranged by Linnæus among the *diandria monogynia*, and of which there are too many species for a particular description here. There is only one method of culture for them all.

Culture of the CLARY.

It is propagated by seeds, which should be sown in the spring upon a bed of fresh earth. When the plants are fit to be removed, they should be transplanted in rows, two feet asunder, and one foot distance in the rows. After the plants have taken root, they will require no farther care, than to be kept clean from weeds. They will thrive upon any soil that is not wet.

CLAVICLE, among botanists, a term expressing a Clasper, or Tendril.

CLEMATIS, *Virgin's-Bower*, a genus of plants, ranged by Linnæus among the *polyandria polygynia*, and of which there are nine species. 1. Clematis, with undivided leaves, of an oval, but somewhat lanceolated form. 2. Clematis, with compound and decomposed leaves, and some of the small leaves trifid. 3. Clematis, with single and trifoliate leaves, and the small leaves either entire, or with three lobes. 4. Clematis, with compound leaves, and the small leaves angularly cut, with wedge-shaped lobes. 5. Clematis, with winged leaves, and heart-shaped, climbing, smooth leaves, commonly called Viorna, or Traveller's Joy. 6. Clematis, with climbing tendrils. 7. Clematis, with the lower leaves winged and jagged, and the upper ones single, spear-shaped, and entire. 8. Clematis, with winged leaves, and spear-shaped, entire small leaves. 9. Clematis, with single,

single, oval, and spear-shaped leaves. The several sorts of this plant make an elegant appearance among the flowering shrubs. The first species is the most singular; the culture of which will be a sufficient direction for all the rest.

The roots of this plant are numerous, long, and spreading; yellowish on the outer part, and strengthened with a white, woody pith within. The stalks are many, and rise two or three feet high; they are firm, fluted, and divided into some few branches. The whole stalk is ridged in the manner of a piece of wire, and is a little hairy. The ground colour is a pale green, and the ridges between the hollows are stained with purple. The leaves stand two at a joint, and the stalk swells out into a thick knot at their base. They have no footstalks, are large, of an oval shape, a firm substance, and a dull green colour, with very high longitudinal ribs on the under part, and hairy at the edges.

The flowers terminate the stalk and branches, these are very beautiful, their colour is a perfect violet blue, and they hang drooping. They are large, and each is formed of four petals, oblong and sharp-pointed; waved a little at the edges, high ribbed, and lightly hairy; and in the centre stands a thick downy tuft of a whitish colour.

Culture of the CLEMATIS.

This plant thrives best, when wild, in a firm, tough soil, and where there is some little shade; for which reason the compost prepared for it must be, equal parts of good garden mould, and firm loamy earth from a pasture; and the place some part of the ground where there is a shelter from the noon-sun, and from cold winds.

The usual and best method of propagating it is by parting of the roots. The plants from seed are sometimes bolder and more vigorous, and the flowers better coloured than ordinary for the first year; but if the parted roots be managed well, the plants raised from them will keep their full perfection; while the others after their first bloom will lose their superiority, and come to an exact equality with the rest.

The time for parting the roots is October, and they must then be planted, in some of the above compost, at two feet and a half distance, and covered two inches. Every year, at the same season, they must be taken up and reduced to a proper bigness, and planted again in the same place, but in a fresh parcel of the compost. After these plantings it will always be proper to give them, once or twice, a little water, and at all times keep them clear from weeds. As there is no design at any time of saving seeds, the flowers should be picked off as they decay; by this means, and the assistance of now and then a watering in dry weather, there will be a succession of bloom throughout the whole summer.

CLEOME, a genus of plants which has no English name; there are eight species of it. 1. Cleome with smooth leaves and a flesh-coloured flower. 2. Cleome with flowers having six stamina, trifoliate leaves, and spear-shaped lobes. 3. Cleome with flowers having six stamina, trifoliate leaves, narrow, spear-shaped lobes, and pods having two valves. 4. Cleome with flowers having twelve stamina, and trifoliate and quinquefoliate leaves. 5. Cleome with flowers having six stamina and trifoliate leaves, whose middle lobe is the largest. 6. Cleome with flowers having six stamina, leaves with seven lobes, a prickly stalk, and hanging pods. 7. Cleome with flowers having six stamina, leaves composed of five and three lobes, and a prickly stalk. 8. Cleome with six stamina to the flowers, and single leaves, which are ovally spear-shaped.

The first sort grows naturally in Asia, Africa, and America. It rises with an herbaceous stalk about a foot high. The flowers, which are of a flesh colour, terminate the stalks in loose spikes. These have four petals, which stand erect, and spreading from each other.

The second species grows naturally in the Levant. This has an upright stalk about a foot high. The flowers come out singly from the side of the stalks, they

are composed of four red petals, which grow in the same manner as those of the former sort.

The third sort is a native of Portugal and Spain. This rises with an herbaceous stalk about a foot high. The flowers come out singly from the sides of the stalks and are of a deep red colour.

The fourth species grows naturally in the island of Ceylon. It rises a foot and a half high. The flowers come out singly at the footstalks of the leaves, their colour is a pale yellow.

The fifth sort is an annual plant, it rises to the height of two feet. The flowers come out singly from the side of the branches upon long footstalks: they have four large flesh-coloured petals.

The sixth sort grows naturally in Egypt and America. This rises with a strong, thick, herbaceous stalk, two feet and a half high. The flowers come out singly from the sides of the branches, forming a long loose spike at their extremities; this spike has single broad leaves, from the bosom of which come out the footstalks of the flowers which are two inches long, and each sustaining a large flesh-coloured flower.

The seventh sort grows naturally at the Havannah. This is also an annual plant, which rises near two feet high, branching out on every side. The main stalk, and also the branches, are terminated by loose spikes of purple flowers, each sitting upon slender footstalks, at the base of which is placed a single oval leaf.

The eighth sort grows naturally in Ceylon; this is an annual plant, which rises with an herbaceous stalk a foot high, garnished with long, narrow, single leaves; from the wings of the leaves come out the footstalks of the flower, each sustaining a single yellow flower.

Culture of the CLEOME.

All these plants, except the second and third species, are natives of very warm countries, and will not thrive in England without an artificial heat, therefore their seeds must be sown in spring upon a good hot-bed, and when the plants are fit to remove, they should be planted in separate small pots, and plunged into a fresh hot-bed, shading them till they have taken fresh root; after which they should have plenty of air in warm weather. When the plants are too high to remain longer in the hot-bed, they should be removed into an airy glass case, where they may be screened from cold and wet, but in warm weather enjoy the free air. With this management the plants will flower soon after, and in autumn they will perfect their seeds.

The second and third species may be sown in the open borders of the garden, where they are designed to remain, for they require no artificial warmth.

CLETHRA, a genus of plants which has no English name, ranged by Linnæus among the *decandria monogynia*; and of which there is but one known species.

This is a beautiful shrubby plant which grows naturally in Carolina, Virginia, and Pennsylvania. It is found in moist places, and near the sides of the rivulets; it rises to the height of eight or ten feet. The leaves are in shape like those of the Alder-tree, but are longer; these are placed alternately upon the branches: the flowers are produced at the extremity of the branches, in close spikes: their colour is white.

Culture of the CLETHRA.

This shrub is propagated by seeds, layers, or suckers from the root. The seeds must be procured from the places in which the plants naturally grow, for they will not perfect their seed in England. They must be sown in the spring in pots placed in a shady situation, and in autumn removed under a frame for the winter. The plants will come up the spring following, and in autumn may be transplanted into a nursery-bed where they must stand two years, they will then have acquired sufficient strength, and must be transplanted to the places where they are designed to stand.

If it is propagated by suckers, they should be carefully taken off in the autumn, with fibres, and planted into a nursery-bed. In two years they will be strong enough to transplant where they are to remain.

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The method of propagating this shrub by layers, is very tedious, for they are generally two years before they get root.

This shrub thrives best in moist land, and requires a sheltered situation, where it may be defended from strong winds, which frequently break off the branches, where they are too much exposed to its violence.

CLIFFORTIA, a genus of plants, for which there is no English name; there are three species of it. 1. Cliffortia, with heart-shaped, indented leaves. 2. Three-leaved Cliffortia, whose middle leaf is cut in three parts. 3. Cliffortia, with spear-shaped leaves, which are entire.

These species are all natives of the Cape of Good Hope. The first sort rises with a weak shrubby stalk, four or five feet high, sending out many diffused branches, which spread on every side, requiring some support; these are decorated with broad stiff leaves of a greyish colour: from the bosoms of which rise a single flower, sitting close to the branch, having no footstalk.

The second sort has very slender, ligneous stalks, which must be supported, otherwise they will fall to the ground. The flowers of this come out from the bosom of the leaves, having very short foot-stalks; they are smaller than those of the former sort.

The third sort rises with a weak shrubby stalk, about four feet high, sending out lateral branches; these are garnished with stiff leaves, placed in clusters, without order.

Between these clusters of leaves the flowers come out in loose bunches.

Culture of the CLIFFORTIA.

The first species is easily propagated by cuttings, which may be planted in any of the summer months, and will soon take root, provided they are screened from the sun, and duly watered; when they have taken root, they may be transplanted each into a separate small pot, and placed in the shade, until they have taken fresh root, after which they may be placed with other hardy exotics, in a sheltered situation till October, when they should be removed into the green-house, or placed under a common hot-bed frame, where they may be screened from the hard frost, but enjoy the free air at all times, when the weather is mild.

The second species requires the same management as the first, and is equally hardy, but must not be over-watered in winter. The leaves of this sort continue green all the year.

The third species is tenderer than either of the former sorts, for which reason, in winter, they must be placed in a warm green-house, and during that season, have but little water. In the summer they may be exposed to the open air in a sheltered situation, but they should not remain too late abroad in the autumn; for if there should be much rain, it would hurt the plants greatly.

CLITORIA, a plant, for which there is no English name, ranged by Linnæus among the *diadelphia decandria*, and of which there are four species. 1. Clitoria, with pinnated leaves, or Blue Clitoria. 2. Clitoria, with trifoliate leaves, single flowers, and bell-shaped cups. 3. Clitoria, with trifoliate leaves, two flowers joined, and bell-shaped cups. 4. Clitoria, with trifoliate leaves, and cylindrical cups to the flowers; these plants are natives of both the Indies, and the culture of the first species will be a sufficient direction for that of the other three.

The Blue Clitoria is a weak and climbing plant: the stalks are long and slender, purplish at the joints when healthy, and elsewhere brown or green. The former is the colour of the lower, the other of the upper parts. The leaves grow with great regularity and beauty, five stand upon every footstalk, and these rise separately and alternately, at equal distances on the plants; they are singly, of a somewhat oval shape, and sharp pointed; they are placed in two pairs, with an odd one at the end of the rib: their colour is a fresh and elegant green, and they are high ribbed.

The flowers grow singly at the insertions of the leaves, one opposite to the other, so that the whole plant, when

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well managed, will be covered with them from top to bottom, at proper and equal distances, and will thus make a very glorious appearance. They are large, and of a most beautiful sky-blue.

Culture of the Blue CLITORIA.

Early in the spring let a hot-bed be made in a careful manner: use good dung, spread it even, and trample it well down, when it is of a due temper cover it eight inches deep with the finest garden-mould, without any addition. On this bed sow the seeds, and cover them half an inch with the same mould: let them be scattered thin, and when they are covered, give the bed a gentle watering. When the plants are come up, let them be treated carefully and tenderly; and when they are four inches high, transplant them into small pots; let these pots be filled with the richest garden-mould that has been well improved by dung at this time, rotted and well blended with it; set one plant carefully in each pot, and gently water it; place these pots in a bark hot-bed, let in a little air, and water them gently.

When they have attained some considerable height and bigness, let larger pots be prepared for them: into each of these put first some of the same rich earth, and then loosening the earth in each little pot, take it out in a lump; trim off the fibres that hang round the surface, set the whole upright in the large pot, and fill it up with the earth; place these in the bark-bed again, and shade and water them till they have taken good root: then remove them into the stove in a fresh hot-bed of bark, and let them be carefully watered; thus they will flower as beautifully as in their native soil.

CLOVE JULY-FLOWER, or **GILLY-FLOWER**, a species of the Carnation. See the article **CARNATION**.

CLUSIA; *The Balsam-Tree*, a genus of plants, of which there are two species. 1. Clusia, with thick, shining, roundish leaves, and a tree-like stalk, commonly called Balsam-Tree in America. 2. Clusia, with veined leaves.

There are two or three varieties of the first sort, which differ in the size and colour of their flowers and fruit: one has a white flower and scarlet fruit, another has a Rose-flower, and a greenish fruit, and the third has a yellow fruit: but these are only supposed to be seminal variations.

The first species is very common in the British islands of America, where the trees grow to the height of twenty feet, and shoot out many branches on every side; the flowers are produced at the ends of the branches. From every part of these trees there exudes a sort of turpentine, which is called in the West-Indies hog-gum.

The second species is a native of Campeachy.

This tree rises to the height of twenty feet; the branches are covered with a woolly down, and the flowers are produced in loose spikes at the end of the shoots; these are smaller than those of the former sort.

Culture of the CLUSIA.

The first species may be propagated by cuttings, which when they are cut off the plants, must be laid to dry for a fortnight or three weeks, that the wounded part may be healed over, otherwise they will rot; when the cuttings are planted, the pots should be plunged into a hot-bed of tanners bark, and now and then gently refreshed with water. The best time for planting these cuttings, is in July, that they may be well rooted before the cold comes on in autumn. In winter these plants may be placed upon stands in the dry stove; but if in summer they are plunged into the tan-bed, they will make great progress, and their leaves will be large, in which the beauty of these plants consists.

The second species is propagated by seeds; the plants are tender, for which reason they must be placed in the tan-bed of the bark-stove, otherwise they will not thrive in this country. They must then be treated in the same manner as other tender plants from the same climate.

CLUSTER, a stalk divided, or branched into several pedicles, sustaining the flowers or fruits set thick together,

ther, in an oblong form.

CLUTIA, a genus of plants, for which there is no English name; there are four species of it. 1. Clutia, with spear-shaped leaves fitting close to the stalks. 2. Clutia, with oval entire leaves, and flowers growing from the sides of the branches. 3. Clutia, with heart-formed spear-shaped leaves. 4. Clutia, with entire spear-shaped pointed leaves, having foot-stalks.

The two first sorts are natives of Africa. The first rises with a shrubby stalk to the height of six or eight feet, putting out many side branches, garnished with small leaves, fitting close to the branches. The flowers come out from the joints, at the fitting on of the leaves, toward the upper part of the branches; these are small and of a greenish white.

The second sort rises about the same height with the first, but the stem is stronger. The branches are garnished with leaves much larger than those of the first. The flowers are much the same both in shape and colour.

The third sort grows naturally in India; this, in its native climate, rises with an upright shrubby stalk, to the height of twenty feet: but with us it seldom exceeds four feet; it sends out many branches at the top, so as to form a large spreading head.

The fourth species grows naturally in the Bahama islands, and also near the Havannah; it rises about twelve or fourteen feet high, with several shrubby stems, which divide into many branches. The flowers come out in long loose spikes from the side of the branches; their colour is white, with yellow summits.

Culture of the CLUTIA.

The two first species are easily propagated by cuttings, during any of the summer months, when they will soon take root; then plant them each into a separate small pot, and place them in a sheltered situation, where they may remain till the middle of October, or later, if the weather continues mild; then remove them into the green-house, and set them where they may have the free air in mild weather, for they only require to be protected from frost. In summer place them abroad, in a sheltered situation, with other hardy exotic plants.

The third species is also propagated by cuttings, during the summer season: but the cuttings should be laid in an airy place for a few days, that their wounded parts may heal before they are planted; these must be set in small pots, and plunged into a moderate hot-bed of tanners bark; and if the season is very warm, the glasses should be shaded in the heat of the day, but they must be watered very sparingly, for much wet will rot them. When they have taken root and begin to shoot, they must have a greater share of air, and be inured by degrees, to bear it openly; then they should be each planted into a separate pot, and placed in the shade till they have got fresh root.

In the summer they should have free air constantly in warm weather, but they must be screened from heavy rains: and in winter placed in an airy glass-case, where they may enjoy the sun.

The fourth species may be propagated in the same manner as the third, with this difference only, that it requires a stove to preserve it through winter, and should have very little water.

COCKSCOMB, or **AMARANTH**. See the article **AMARANTH**.

CODLING-TREE, a species of the Apple-Tree. See **APPLE-TREE**.

COFFEE-TREE, *Coffea*, a genus of plants, ranged by Linnæus among the *pentandria monogynia*, and of which there is but one species.

This tree is a native of Arabia Felix, and Ethiopia, where it rises above sixteen or eighteen feet high: but in England it rarely rises to more than twelve; it is an evergreen, and makes a beautiful appearance at every season in the stove, but particularly when it is in flower.

The Coffee-Tree is now propagated in great plenty in many parts of America: but the produce of these countries are greatly inferior to that of Arabia.

Culture of the COFFEE-TREE.

This plant is propagated by seeds, which should be sown soon after they are gathered from the tree; for if they are kept but a short time out of the ground, they will spoil, which is the reason that this tree has not been spread into more different countries, for the seed will not keep long enough to be sent into any place. In order therefore to cultivate this plant in any part of the world, it is absolutely necessary to have it carried thither growing. The berries of this plant are commonly ripe with us in April, at which time they should be sown in pots of fresh light earth, covering them half an inch thick with the same light earth; then plunge the pots into a moderate hot-bed of tanners bark, observing to refresh them often with water, as also to raise the glasses in the heat of the day, to admit fresh air; and in very hot weather it will be proper to shade the glasses with mats, otherwise the earth in the pots will dry too fast, and prevent the vegetation of the seeds. It must be observed, that the taking off the pulp of the berries, which has been by some people directed as absolutely necessary, is a great mistake. When this plant is removed, great care should be taken not to injure the roots, and also preserve the earth to the roots; nor should they be kept any time out of the ground: for if their fibres are suffered to dry, they are very subject to mould and perish.

The soil in which this tree thrives best, is composed in the following manner: one load of fresh, light, loamy earth, one load of rotten cow-dung, with half a load of sea-land: these are to be well mixed together, and laid in a heap six months before it is used, in which space it must be turned several times.

COLE-SEED, or **RAPE-SEED**. See the article **RAPE-SEED**.

COLE-WORT, a species of the Cabbage, and cultivated in the same manner. See **CABBAGE**.

COLLIFLOWER. See **CAULIFLOWER**.

Foreign COLT'S-FOOT, *Cacalia*, a genus of plants, ranged by Linnæus among the *syngenesia polygamia*, and of which there are eight species. 1. Foreign Colt's-Foot, with kidney-shaped leaves, which are sharply indented. 2. Foreign Colt's-Foot, with smooth heart-shaped leaves, sawed on their edges. 3. Foreign Colt's-Foot, with a triangular leaf, eared at the base, and white flowers. 4. Foreign Colt's-Foot, with an herbaceous stalk, heart-shaped, sinuated leaves, and five florets in each empalement. 5. Foreign Colt's-Foot, with the leaf and appearance of Fig-Marigold, commonly called African-Tree Groundsel. 6. Foreign Colt's-Foot, with a compound shrubby stalk, and plain spear-shaped leaves, and the foot-stalks having scars. 7. Foreign Colt's-Foot, with a shrubby stalk, guarded on every side with broken rough foot-stalks. 8. Foreign Colt's-Foot, with a shrubby stalk, oblong oval leaves, and three lines connected to the base of the foot-stalk.

The first species grows naturally in Austria and the Helvetian mountains, but is frequently preserved in curious gardens for the sake of variety; it has a fleshy root, which spreads in the ground, from which springs up many leaves, standing on single foot-stalks; between these the stalk rises about a foot and a half high, branching toward the top. The branches are terminated by purplish flowers, growing in a sort of umbel.

The second sort has the appearance of the first; but the stalks rise higher, and the leaves have much longer footstalks than those of the first. The flowers are of a deeper purple colour.

The third sort grows naturally in North-America. This has a perennial creeping root, which sends out many stalks rising to the height of seven or eight feet, and are terminated by umbels of white flowers.

The fourth sort is a native of America, it has a perennial root, and an annual stalk which rises four or five feet high, terminated by umbels of yellowish, herbaceous flowers.

The fifth sort grows naturally at the Cape of Good Hope, it rises with strong round stalks, to the height of seven or eight feet, which are woody at bottom, but soft and

and succulent upward, sending out many irregular branches, at the extremity of which the flowers are produced in small umbels; they are white, tubulous, and cut into five parts at the top.

The sixth sort grows naturally in the Canary islands. This rises with a thick fleshy stem divided at certain distances, as it were into so many joints; each of these divisions swell much larger in the middle, than they do at each end; toward their extremities they are garnished with long, narrow, spear-shaped leaves; as these fall off they leave a scar at the place, which always remain on the branches. The flowers are produced in large clusters at the extremity of the branches, they are tubulous, and of a faint Carnation colour.

The seventh sort is a native of the Cape of Good Hope, it resembles the sixth in its form and manner of growth; only the leaves do not fall off entire like those of the other, but break off at the beginning of the footstalk. This sort hath not as yet produced any flowers in England.

The eighth sort has been long known in the English gardens, it rises with many succulent stalks from the root, as large as a man's finger. This sort very rarely flowers in England.

Culture of the Foreign COLT'S-FOOT

The first and second species are propagated by parting of their roots, for they seldom produce good seeds in England. The best time to transplant and part their roots is in the autumn. They require a loamy soil; and a shady situation.

The third and fourth sorts are propagated in great plenty both by their seeds, and their spreading roots. The roots should be transplanted in autumn; they require a moist soil, and a shady situation.

The fifth and sixth sorts are easily propagated by cuttings, during the summer months. These cuttings should be laid to dry for a fortnight, that the wound may be healed before they are planted. If they are planted in June or July they will take root in the open air. They succeed best in a light sandy earth. In winter they should be placed in an airy glass case, where they may enjoy the sun; and in mild weather admit the air. They must always be protected from the frost, and have but little water.

The seventh and eighth sorts are propagated in the same manner as the fifth and sixth, only that the seventh requires to be kept drier both in winter and summer.

COLUMBINE, *Aquilegia*, a genus of plants ranged by Linnæus among the *polyandria pentagynia*, and of which there are three species. 1. Columbine with crooked nectaria, called double starry Columbine. 2. Columbine with strait nectaria shorter than the flower petals, which are spear-shaped. 3. Columbine with strait nectaria, and stamina longer than the flower petals.

The first species grows naturally in most countries in Europe; the second is a native of Switzerland, and the third of Virginia and Canada. The same method of culture, is proper for them all.

The double starry Columbine has a large whitish root, long, and thick, divided into many parts, hung with long fibres, and of many years duration. The stalk is a yard high, slight, upright, branched, reddish, and a little hairy. The leaves are large, but composed of many parts, these are disposed in threes on branched footstalks, and the principal of them are divided lightly into three lobes by indentings. Their colour is a faint blueish, or greyish green.

The flowers are numerous, large and beautiful: they are composed of a great number of plain oblong petals, and these spread themselves out in a radiated or starry form: the outer ones being largest, and those within smaller to the centre. Their colour, when most perfect, is of a fine high scarlet; but, in some of the plants, it varies from this into a faint, yet not unpleasing red; in others it runs through all the changes of blue, purple and flesh colour, even to absolute white, and in some flowers there will be an agreeable mixture of green. All

these colours will be obtained from the seeds of one plant, therefore they are no more than seminal varieties; and they will also often, from the same seed, differ in their form.

Culture of this COLUMBINE.

This plant is too hardy to require any great care in its preservation, but it is from a proper culture only that the varieties already mentioned are to be obtained.

The gardener must make such a compost for it as nature directs, light, and yet rich; in the following manner; mix a barrow of the finest pasture-mould, a bushel of pond-mud, and two pecks of rotted cow-dung, with one peck of river sand; these must be well wrought together. Chuse a place in the seminary which is on a rising position, and has a good deal of shade; dig out the mould, and in August put in the compost six inches deep.

Seeds must be sowed from some strong and well growing plants of the common Columbine; and as they are ripe in July they will have had a fortnight to harden in before they are wanted for sowing. They must now be scattered moderately thick upon the bed prepared for them; chuse the evening of a showery day to sow them. Sift over them a quarter of an inch of dry compost, and lay a piece of Hawthorn bush upon the bed. In spring the young plants will appear. The weeds must be carefully taken up, and the plants thinned where they stand too close. From this time they must be often weeded, and occasionally watered. When they have a month's growth, let them be thinned again, taking up the weakest plants: these may be planted out upon another piece of ground, the others remaining undisturbed till the latter end of September; and being all that time kept carefully weeded and watered.

The latter end of September prepare a bed for them in the garden, let the same compost be used, but a place chosen a little more open, than that in the nursery. The plants must be set regularly in this bed at two feet distance. Thus they must remain all the winter. In spring they must be weeded, and the mould should be broke between them with a trowel. In June following they will flower. There will be found among them some of the curious sorts, and some of the common; but the latter will be very fine in their kind. As soon as the flowers fade cut down the stalks near the ground, and throw a covering of fresh compost, an inch thick upon the bed. The next year they will flower stronger, and two or three of them should then be marked for seed. This should be sown in the same manner for the first, and the process repeated every year. Thus by degrees the gardener will have all the elegant kinds.

The fine roots must be preserved with care, and managed well, or they will degenerate. Every autumn they must be taken up, and when too large, parted; and every time this is done they must be allowed new compost. There is little trouble in raising this plant from seeds, therefore it should be constantly repeated.

Inverted COLUMBINE. This Columbine is not a distinct species from the common kind, but one of these innumerable varieties which rise from well ripened and well managed seeds.

The root is composed of numerous fibres, hung to a long and firm head. The leaves are supported on long, slender, but firm footstalks, of a reddish colour; and are composed of many divisions, placed in threes: these separate parts are obtuse, and of a blueish green. The stalk is two feet high, purplish, tolerably firm, but slender. On it stand several leaves irregularly, resembling those from the root; and at the top of it divides into many branches. The flowers are large, double, and very beautiful: their colour often varies; they are blue, red, or white, and sometimes mixed of two of these colours in a very pleasing manner. They are thick set with curled and rounded parts, and their nectaria or horns stand forward; the flower appears fixed to its footstalk by the wrong end, and this singularity adds to the elegance

Culture of this COLUMBINE.

Several of the double Columbines ripen seeds as perfectly as the single, and it is from some of these that seed for the above variety must be saved; for this purpose let the gardener mark two or three plants which have the largest and fairest flowers: and from those save the seeds, as we have directed on former occasions; when this is thoroughly hardened, let it be sown in the nursery; and as the plants come up, let them be weeded, watered, thinned, and every way assisted in their growth: and when they have once flowered, let them be brought into the garden.

The variety is endless that will thus rise from one parcel of seed collected from one plant; there will be single and double, rosy, starry, and inverted, perfect and degenerate flowers: in colour there will be all the shades of blue, white, and red, and all colours that can be derived from various mixtures of these; among the rest there will be some variegated, streaked, clouded and spotted; these are the finest, and from these, seeds should be afterwards saved; these numerous varieties ought to recommend the plant to the gardener; nor is there a little regard due to its form and time of flowering; this season is a kind of middle space between the spring and autumn flowers: and there are fewer particular to it than to either of the others. A bushy plant, which produces abundance of bloom at such a time, is therefore valuable.

COLUTEA, *Bladder Senna*, a genus of plants, ranged by Linnæus among the *diadelphia decandria*, and of which there are three species. 1. Colutea, with the smaller leaves heart-shaped, or the common Bladder Senna. 2. Shrubby Colutea, with oblong oval leaves. 3. Herbaceous Colutea, with narrow leaves.

The first species grows naturally in Austria, France, and Italy, and is commonly cultivated in the nursery gardens as a flowering shrub to adorn plantations; the second sort is tender, being a native of Africa, and will not bear the severe winters of this country; the third species is also a native of Africa, and is a low annual plant, which seldom grows more than a foot and a half high. The flower it produces being small, and the plant having very little beauty, it is preserved in botanic gardens only, for the sake of variety.

Culture of the COLUTEA.

The first species is propagated by sowing the seed in a bed of common earth: and when the plants are come up, they must be kept clear from weeds; and in the autumn following transplanted either into nursery-rows, or in the places where they are designed to remain; they should not be suffered to be long in the nursery before they are transplanted.

The second sort is propagated by seeds sown early in the spring, upon a warm border of light earth. The plants will flower in August; and if the season proves favourable, ripen their seeds very well.

In autumn they should be transplanted young: and if they stand in a sheltered situation, they will live in the open air for three or four years.

Jointed-Podded COLUTEA, a species of *Coronilla*. See the article *CORONILLA*.

COMFREY, *Symphytum*, a genus of plants, classed by Linnæus among the *pentandria monogynia*, and of which there are three species. 1. Comfrey, with oval spear-shaped, running leaves. 2. Comfrey, with the upper leaves placed opposite. 3. Comfrey, with oval leaves, and short foot-stalks.

The first species is a native of England, and grows by the side of ditches, and other moist places, in most countries in Europe.

The second species grows naturally in Germany; and the third on the sides of rivers near Constantinople.

Culture of the COMFREY.

These are all perennial plants, and may be propagated either by sowing their seeds in the spring, or parting their roots in the autumn.

They should be planted about two feet asunder, and will require no care but to be kept clean from weeds, as they will grow in any soil or situation.

COMMELINA, a genus of plants, which has no English name; there are five species of it. 1. Commelina, with unequal petals, oval, spear-shaped, pointed leaves, and a smooth trailing stalk. 2. Commelina, with unequal petals, oval, spear-shaped leaves, and a single, upright, rough stalk. 3. Commelina, with unequal petals, smooth, spear-shaped, obtuse leaves, and a creeping stalk. 4. Commelina, with equal petals, and oval, spear-shaped leaves, which are hairy on their under-side. 5. Commelina, with equal petals, thick foot-stalks to the flower, and narrow, spear-shaped leaves.

The first sort grows naturally in the West-Indies, and Africa; it is an annual plant, and has several trailing stalks, two or three feet long.

The leaves are of a deep green. The flowers, which are blue, come out from the bosoms of the leaves.

The second sort grows naturally at Pennsylvania; it rises upon upright, slender, rough, herbaceous stalks, about two feet high; the leaves are like those of the first. The flowers come out from the bosom of the leaves, at the upper part of the stalk, sitting upon short foot-stalks; these are of a pale, blueish colour.

The third sort grows naturally in Africa; this hath many trailing stalks three or four feet long. The leaves of this are like those of the first, but the flowers are larger, and of a deep yellow.

The fourth sort grows naturally near Vera Cruz, in New Spain; from the root of this rises one or two inclining stalks; the flowers are produced toward the upper part of the stalks, from the bosom of the leaves, standing upon slender foot-stalks; they are composed of three blue petals, pretty large and roundish, and three smaller, which are green.

The fifth sort grows naturally in the West-Indies: this hath trailing stalks like the first. The flowers are produced at the end of the stalks, upon thick foot-stalks, three flowers generally sitting on each; they have three equal large petals of a sky blue, and three smaller, which are blue.

Culture of the COMMELINA.

All the species are propagated by seeds. The first will thrive in the full ground: but if the seeds are sown in autumn, upon a warm border of light earth, the plants will rise early in the spring, and from these good seeds may be expected; whereas those which are sown in the spring, often lie long in the ground, and rarely ripen their seed. After the plants come up, they require no other care than being kept clean from weeds.

The second species has a perennial root; this seldom ripens its seeds in England, but the root sends out off-sets, by which the plant is easily propagated; if this sort is planted in a sheltered situation, it will live through the winter in the full ground. The best time to transplant and part these roots, is about the end of March.

The other sorts are tender, so their seeds must be sown on a moderate hot-bed in the spring; and when the plants are two inches high, they should be transplanted to a fresh hot-bed to bring them forward.

When they have taken root, admit the fresh air every day, when the weather is warm, which will prevent their growing up weak. In June they must be carefully taken up, and planted on a warm border of light earth, carefully shading them till they have taken root, after which they will require no other care than to be kept clean from weeds; with this management the plants will flower, and produce good seeds.

COMPARTMENTS, in gardening, are beds, plats, borders, and walks, laid out according to the form of the ground, and depend more on a good fancy than on any set of rules for their construction.

They are also sometimes merely diversities, or knots of flower-gardens, or parterres, of which there are infinite variety, according to the fancy of the designer. Plain Compartments are pieces of ground, divided into equal squares and flower-beds, marked out by lines, and made of regularly equal length and breadth.

Some allow to these squares borders of two feet broad, if the plat of ground be small, and if larger, of three

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fect, and edge the borders with box, or with upright, hardy Thyme; the alleys up between, are to be laid with sand or gravel, and kept clean weeded.

COMPOST, in husbandry and gardening, several sorts of soils, or earthy matter, mixed together, in order to make a manure for assisting the natural earth in the work of vegetation, by way of amendment or improvement.

Composts are various, and ought to be different, according to the different nature or the quality of the soils which they are designed to meliorate, and according as the land is either light, sandy, loose, heavy, clayey, or cloddy. A light, loose land requires a compost of a heavy nature, as the scouring of deep ditches, ponds, &c. so, on the other hand, land that is heavy, clayey, or cloddy, requires a compost of a more sprightly and fiery nature, that will insinuate itself into the lumpish clods, which, if they are not thus managed, would very much obstruct the work of vegetation.

The great use of composts is for such plants as are preserved in pots, or tubs; or sometimes it is used for small beds, or borders of flower-gardens: but it is too expensive to make composts for large gardens, where a great quantity of soil is required. In making of composts, great care should be had that the several parts are properly mixed together, and not to have too much of any one sort thrown together.

COMPOUND-FLOWER, is that consisting of several florets, or semi-florets, or both together, included in a common cup, so as to make up one whole flower.

CONCEPTACULUM, a kind of pericarpium, composed of soft and less rigid valves, and containing only one cavity.

CONE, a term made use of by botanists to signify a hard dry seed-vessel, of a conical figure, for the most part scaly, adhering closely together, and separating when ripe.

CONSERVATORY. See **GREEN-HOUSE**.

CONVOLVULUS, *Bindweed*. See the article **BINDWEED**.

Scarlet **CONVOLVULUS**, *American Jasmine*. See the article *American JASMINE*.

CORAL-TREE, *Erythrina*, a genus of plants, ranged by Linnæus among the *diadelphia decandria*, and of which there are six species. 1. Low Coral-Tree, with a very long spike of flowers, and thick root, commonly called the Carolina Coral-Tree. 2. Smooth American Coral-Tree. 3. Prickly Three-leaved American Coral-Tree, with a very red flower. 4. Smaller Three-leaved American Coral-Tree, with blacker spines, and seeds. 5. Three-leaved American Coral-Tree, with acute-pointed leaves, and scarlet seeds. 6. Coral-Tree, without spines, having a longer close flower.

The first sort grows naturally in South Carolina. It seldom rises more than two feet high. The leaves are of a deep green, and shaped like the point of an arrow. The stalks are terminated by a long spike of scarlet flowers.

The second sort rises to the height often of ten or twelve feet, sending out many strong branches, garnished with leaves of a dark green. The flowers come out at the end of the branches, in short thick close spikes, of a deep scarlet colour, which make a most elegant appearance.

The flowers seldom appear till the leaves drop, so that the branches are often naked when the flowers are out.

The third sort differs from the second, in having its trunk, branches, and the foot-stalks of the leaves, armed with short crooked spines, the leaves and flowers being like those of the second sort.

The fourth sort has shrubby stalks, which divide into branches; the leaves are smaller than those of the two last sorts: the flowers are of a paler scarlet, and grow in looser spikes.

The fifth sort grows naturally at La Vera Cruz, and the Cape of Good Hope; the stalks do not rise so high as the second sort: the leaves are also much smaller, and have long acute points; the flowers grow in very long close spikes, and are of a beautiful scarlet colour.

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The sixth sort grows in Jamaica, and some of the other islands in America; the stalk is not very large, but shoots out into branches at a little distance from the ground, which grow erect, and form a bushy shrub; the flowers come out at the end of the branches in short spikes; the standard of the flower is long, and the sides turn down over the wings, which are also longer than those of the other species, and the whole flower is more closed.

Culture of the CORAL-TREE.

These plants when they produce their flowers, are the greatest ornaments of the stoves yet known; but though in their native places of growth they produce plenty of flowers every year, yet it is seldom they flower in this country, or indeed in any of the northern parts of Europe.

These plants are best propagated by seeds, when they can be procured from the countries where they naturally grow; these seeds should be sown in small pots, and plunged into a moderate hot-bed, where if they are good, the plants will come up in four or five weeks. When the plants are about two inches high, let them be carefully shaken out of the pots, and planted each in a separate small pot, filled with light earth, and plunged into a moderate hot-bed of tanners bark: here let them be shaded from the sun till they have taken new root, after which they should have a large share of air admitted to them, whenever the weather is mild. Let them be frequently refreshed with small quantities of water, and in autumn be removed into the stove. As the plants grow in strength, they may be more hardily treated.

They may also be propagated by cuttings planted in pots, during any of the summer months, and treated like other seedling plants.

CORIANDER, *Coriandrum*, a genus of plants, ranged by Linnæus among the *pentandria digynia*, and of which there are only two species. 1. Coriander, with globular fruit, or the greater Coriander. 2. Coriander, with twin fruit.

These are annual plants; the first species is a native of Italy, and is cultivated in gardens and fields for the sake of the seeds. The second species is a native of the southern parts of Europe, and is to be met with in botanic gardens only, where it is preserved for the sake of variety.

Culture of the CORIANDER.

They are propagated by sowing the seeds early in the spring, in an open situation, upon a bed of good fresh earth. When the plants are come up, they should be hoed to about four inches distance every way, clearing them from weeds. If the seeds of this plant are sown in autumn, they will rise much stronger, and produce a greater quantity of seeds than those sown in the spring.

CORK-TREE, a species of the Oak-Tree. See the article **OAK-TREE**.

CORN-FLAG, *Gladiolus*, a genus of plants ranged by Linnæus among the *triandria monogynia*, and of which there are six species. 1. Corn Flag with sword-shaped leaves, and flowers growing at a distance from each other. 2. Corn Flag with sword-shaped leaves and imbricated flowers. 3. Corn Flag with narrow leaves, a very single stalk, and spiked flowers. 4. Corn Flag with narrow leaves, flowers growing at a distance from each other, and the tube longer than the margins of the petal. 5. Corn Flag with a branching stalk, and narrow leaves. 6. Corn-Flag, with a branching stalk, flowers growing in heads, upon footstalks, and a tuberos root.

Culture of the CORN FLAG.

These are all perennial plants: the first species grows naturally in arable land, in the southern parts of Europe; and if once planted in a garden, will multiply so fast, without any culture, as to become a troublesome weed.

The second kind grows naturally in Russia, and is propagated as easily as the first.

The third, fourth, fifth, and sixth sorts are natives of Africa, and will not bear the open air of this country in the winter.

They

They are propagated by off-sets, which should be planted in pots filled with light kitchen-garden earth; and in winter placed in the green-house, to protect them from frosts.

These plants are also propagated by seeds which are frequently perfected in England; these should be sown about the end of August in pots filled with light earth, and placed in a shady situation, till the middle of September; then the pots should be removed, where they may have the sun great part of the day. In October place them under a garden frame, where they may have the air in mild weather. In spring the young plants will appear, and they must be watered gently once in eight or ten days. In May remove the pots to a sheltered situation, where they may enjoy the morning sun till noon. If the season proves dry, refresh them, now and then, with water.

About the end of June the leaves will decay, then the roots must be taken up, and mixed with sand, and kept in a dry room till the end of August, at which time they should be planted again. The roots are so small that four or five may be planted into each half-penny pot filled with light earth: place them where they may have the forenoon sun till the middle of September; then they should have a warmer situation till October, when they must be placed under a hot-bed frame, as before; and treated in the same manner during the winter season.

In the spring they must be placed in the open air, till their leaves decay, when they may be taken out of the ground and treated as before. The roots, by this time, will have grown to a large size, therefore they should have a separate half-penny pot, and be treated in the same manner as the old roots.

CORNICULATE, horned; thus we say Corniculate pods, &c.

CORN MARIGOLD, *Chrysanthemum*. See the article **CHRYSANTHEMUM**.

COROLLA, among Botanists, is the most conspicuous part of a flower. It expresses the coloured tender part, which surrounds the organs of generation. The part it is composed of are called petals; if it consist only of one piece, it is called monopetalous: if of more, it is said to be dipetalous, tripetalous; and so on, as it consists of two, three, four, or more parts. See **PETAL**, &c.

COROLLISTÆ, among the botanical authors, are those who have attempted the establishing the classes and distinctions of plants, on the different form of the Corolla, or leafy part of the flower, without paying the due regard to the apices, stamina, and pistillum, the parts of fructification contained within it. Of these are Riverius and Tournefort.

COROLLULA, among botanists, a term used to express those little partial flowers, which together constitute the whole compound ones. They are of two kinds, the tubulated, and the ligulated; the former are always furnished with a campanulated limb, divided into four or five segments: the latter or ligulated Corollula, have a flat linear limb, terminated by a single point or by a broader extremity, divided into three or five segments.

CORONA, any thing growing on the head of a seed, the Corona of seeds are of various kinds; they are sometimes simple, consisting only of a dentated membrane; sometimes pappose, consisting of a downy matter. The downy matter in some cases is immediately affixed to the seed, in others it has a pedicle growing from it; and it is sometimes composed of simple filaments, sometimes it is ramose.

CORONATED, furnished with a Corona. See the former article.

CORONILLA, according to Linnæus the name of a genus of plants, comprehending Coronilla, strictly so called, or jointed podded Colutea; Emerus, or Scorpion Senna; and Securidaca, or Hatched-Vetch; but by other authors considered as three distinct genera. Linnæus has also ranged it among the *diadelphia decandria*. There are eight species of it. 1. Shrubby Coronilla

with the unguis of the flowers twice the length of the cup, or the Emerus, or Scorpion Senna. 2. Shrubby Coronilla with five spear-shaped lobes, and spear-shaped stipulæ. 3. Shrubby Coronilla with roundish stipulæ. 4. Shrubby Coronilla with eleven lobes, and the outer one the largest. 5. Herbaceous Coronilla with hooked, sword-shaped pods, or Securidaca, or Hatched Vetch. 6. Herbaceous Coronilla with five, taper, erect, jointed pods. 7. Coronilla with a climbing, flaccid stalk. 8. Smooth leaved herbaceous Coronilla, with numerous, erect, rounded, and knotted pods, or various flowered Coronilla.

The first species grows naturally about Geneva, Montpelier, Salernum, and Vienna. The second is a native of the south of France, and the third of Spain and Italy. The fourth and sixth species are natives of Crete. The fifth sort grows naturally in the corn fields of Spain. The seventh is a native of South-America, and the eighth, of Germany, and most other parts of Europe.

Culture of the CORONILLA.

The first sort is propagated by sowing the seeds in March, upon a bed of light sandy earth, it must be kept clean from weeds and watered in dry weather, which must be continued when the plants come up. About Michaelmas, draw out the largest and transplant them into the nursery, allowing the distance of one foot between each plant in rows three feet asunder. The following Michaelmas, those left in the seed bed may be transplanted in the same manner. Here they should remain two years, at the end of which time they may be planted into the places where they are to remain.

This sort may also be propagated by laying down the tender branches, which will take root in a year's time, after which they may be transplanted into the nursery, and managed in the same manner as the seedling plants.

The second and third species are propagated by seeds, which in April must be sown upon a bed of light earth. When the plants are fit to be removed, transplant them into a warm border, and carefully shade them till they have taken root; after which they will require no other culture than being kept clear from weeds.

The fourth and sixth species are also propagated by seeds, which must be sown in spring either on a gentle hot-bed, or on a warm border of fresh light earth. When the plants are fit to be removed, they should be transplanted either into pots, or into a bed of good rich earth, at about four or five inches distance every way. Here let them remain till they have obtained strength enough to be planted out for good, either into pots filled with light fresh earth, or into a warm border.

The seeds of the fifth species must be sown in the spring, on borders of light fresh earth.

When the plants come up, they should be thinned to the distance of two feet one from another, and kept clean from weeds, which is all the culture they require.

The seventh species must be raised from seeds as directed for the former sorts, but this will require to be raised and preserved in the bark stove.

The eighth species will require more care in its culture, to keep it within bounds than to make it grow, any unfavourable part of the garden may be allotted for it; the best will be on the side of some wilder's quarter, and it should be raised from seeds in the place where it is to continue. The seeds ripen in August, and must be sown in April; when the plants come up they should be thinned to two feet distance: after this they may be taken up every year in October, and reduced to a due compass, for otherwise they will quickly overrun a large tent of ground.

CORTUSA, *Bear's Ear Sanicle*, a genus of plants ranged by Linnæus among the *pentandria monogynia*, and of which there are two species. 1. Cortusa with cups shorter than the Corolla or purple Cortusa. 2. Cortusa with cups longer than the Corolla. One method of culture is proper for them both.

The leaves of the purple Cortusa rise in a fine large cluster, on long reddish footstalks; they are broad, deeply

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deeply jagged at the edges, and of a fine green on the upper side, but greyish underneath. The flowers crown the summit of the stalk, which is round, upright, and eight inches high, in a very elegant head; they are about ten in number, and each hanging its long delicate footstalk, they spread out, and droop downward; they are large, of a delicate purple, and have a light fragrance.

Culture of the CORTUSA.

This plant requires no shelter in our gardens; it may be planted in an open situation and in the common mould. The roots increase abundantly, and the best method to propagate the plant is by parting them, as there is no advantage in raising it from seed, for the flower admits no variegation. There is this farther disadvantage, the seeds ripen poorly with us. The plants should be allowed a foot distance and often watered.

CORYMBIFEROUS Plants, are such as have a compound discous flower, but their seeds destitute of down. They bear their flowers in clusters, spreading round in the form of an umbrella. Of this kind are the common Marygold, common Daisy, Camomile, &c.

CORYMBUS, among ancient botanists, signified clusters of Berries, as those of Ivy, &c. It is also used by modern botanists, to signify a compound discous flower, which does not fly away in down.

COSTMARY, a species of the Tansey or Tanzy. See the article **TANSEY**.

COTTON, *Gossypium*, a genus of plants of which there are four species. 1. Cotton with leaves having five lobes, and an herbaceous stalk. 2. Cotton with entire leaves having three lobes. 3. Cotton with hand-shaped leaves, having five spear-shaped lobes, and a shrubby stalk. 4. Finest American Cotton with a green seed.

The first species is the common Levant Cotton, which is cultivated in several islands of the Archipelago, likewise in Malta, Sicily, and the kingdom of Naples; it is sown in tilled ground in the spring of the year, and is ripe in about four months after, when it is cut down in harvest as corn in England, the plants always perishing soon after the seeds are ripe: this plant grows about two feet high, with an herbaceous stalk, garnished with smooth leaves divided into five lobes. The stalks send out a few weak branches upward, which are garnished with leaves of the same form but smaller. The flowers are produced at the extremities of the branches; these have two large empalements, the outer is cut into three parts, and the inner into five. The petals of the flower are of a pale yellow colour, inclining to white; these are succeeded by oval capsules, which open in four parts, having four cells, filled with seeds wrapped up in a down, which is the Cotton.

The second grows naturally in several islands of the West Indies; this rises with a shrubby smooth stalk four or five feet high, sending out a few side branches, which are garnished with smooth leaves divided into three lobes. The flowers are produced at the ends of the branches, which are shaped like those of the former sort, but are larger, and of a deeper yellow. The pods are larger, and the seeds are black.

The third sort has a perennial shrubby stalk, which rises six or eight feet high, and divides into many branches, which are smooth. The flowers are produced at the ends of the branches; these are larger than those of the two former sorts, and are of a deep yellow colour. The pods of this sort are larger than those of the former.

The fourth sort is a native of the East or West-Indies; this is an annual plant, which perishes soon after the seeds are ripe. It rises to the height of three feet or more, and sends out many lateral branches, these are hairy, and garnished with leaves, having in some three, and in others five acute-pointed hairy lobes. The flowers are produced from the sides, and at the ends of the branches, which are large, of a dingy sulphur colour, each petal having a large purple spot at the base; the flowers are succeeded by oval pods, which open in

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four cells, filled with oblong green seeds, wrapped up in a soft down. The staple of this is much finer than either of the other species, and the Cotton from this shrub is preferable to any other yet known.

Culture of the COTTON.

These, being all tender plants, will not thrive in the open air in England. The first and fourth sorts will ripen their seeds here, if they are sown early in the spring, upon a good hot-bed; and, when the plants come up, transplanted each into a separate pot, and plunged into a hot-bed of tanners-bark, to bring them forward. When they are grown too tall to remain under the frames, they should be removed into the tan-bed of the stove, and shifted into larger pots if their roots have filled the others. With this management their flowers will appear in July, and towards the end of September the seeds will ripen, and the pods will be as large as those produced in the East and West Indies; but if the plants are not brought forward early in the spring, it will be late in the summer before the plants will appear and there will be no hopes of the pods coming to perfection.

The shrub Cotton will rise from the seeds very easily, if they are sown upon a good hot-bed, which should be done early in the spring, and if brought forward in the same manner as has been directed for the former sorts, the plants will grow five or six feet high the same summer; but it is difficult to preserve the plants through the winter, unless they are hardened gradually in August during the continuance of the warm weather, for being forced on in summer renders them incapable of resisting the least injury. They should then be placed in the bark-stove in autumn, and kept in the first class of heat; this is the only method of preserving them through our winters.

Silk COTTON-TREE, *Bombax*, a genus of plants ranged by Linnæus among the *monodelphia polyandria*, and of which there are three species. 1. Silk Cotton with fingered leaves and a prickly, shrubby stalk. 2. Silk Cotton with fingered leaves and a smooth stalk. 3. Silk Cotton with five cornered hairy leaves, and a jointed herbaceous stalk.

The first and second species are natives of the East and West Indies. The first sort rises to the height of five or six feet, and spreads naturally into many branches. The leaves are large and beautifully formed; each is divided, nearly to the stalk, into five parts, which spread as the fingers of a hand: their colour is a very deep green on the upper side, but paler underneath; and on the stalk there are prickles. The flowers are large and very elegant, their colour is a pale yellow, often tinged with purple; and their cups are a singular beauty in the plant, they are vast, rounded, ribbed and jagged. The flowers do not terminate the branches, but grow in great number from the sides of the shoots. After these come the seed-vessels, which are rounded but pointed, and contain each, in four cells, many large seeds, wrapped round in a snowy and soft down, which is Cotton.

The second sort grows with a very strait smooth stem to a great height. The branches toward the top are garnished with leaves composed of five, seven, or nine oblong, smooth, little leaves, which are spear-shaped. The flower buds appear at the ends of the branches, and soon after the flowers expand, which are composed of five oblong, purple petals. When these fall off, they are succeeded by oval fruit, as large as a swan's egg, having a thick ligneous cover, which, when ripe, opens in five parts, and is full of a dark short Cotton, inclosing many roundish seeds, as large as small pease.

The third sort is a native of the Spanish West Indies; it has soft herbaceous stalks very full of joints. The leaves come out on long hairy footstalks at the top of the plant; their under sides are covered with a short, brown, hairy down, and are cut on their edges into five angles. These plants have not as yet flowered in England; but the down, inclosed in the pods, which are procured from the places where it is native, is of a most beautiful purple.

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Culture of the SILK COTTON-TREE.

The plants of all these sorts are propagated by seeds, which must be sown on a hot-bed in the spring; those of the two first sorts will be strong enough to transplant in a short time after they are up, when they should be each planted in a separate small pot, and plunged into a moderate hot-bed of tanners bark, being careful to shade them from the sun, till they have taken fresh root, after which they should have a large share of air admitted to them when the weather is warm, to prevent their being drawn up weak. In this bed they may remain till autumn, provided there is room for the plants under the glasses. When the heat of the bed declines, the tan should be stirred up, and fresh added to it; and if the plants have filled the pots with their roots, they should be shifted into pots a little larger: but there must be care taken not to over-pot them, for nothing is more injurious to these plants, than being put into large pots, in which they will never thrive.

In autumn they must be removed into the bark-stove, where they must constantly remain, being too tender to thrive in this country, in any other situation. In winter they must have but little water, especially if they cast their leaves: but in summer they should be constantly refreshed with it, and in warm weather must have plenty of fresh air admitted to them.

These plants require a large stove where they may have room to grow.

COVENTRY-BELLS, a species of the Campanula. See the article CAMPANULA.

COWSLIP, a species of the Primrose. See the article PRIMROSE.

Jerusalem COWSLIP, a species of Lungwort. See the article LUNGWORT.

CRAB-TREE, a species of the Apple-Tree. See APPLE-TREE.

CRANE'S-BILL, *Geranium*. See the article GERANIUM.

CRANIOIARIA, a genus of plants, which has no English name, and of which there are only two species. 1. Craniolaria, with heart-shaped, angular leaves. 2. Craniolaria, with spear-shaped, indented leaves.

The first species grows naturally in the neighbourhood of Carthage, in New Spain; it rises with a branching stalk, about two feet high: the branches come out opposite, the flowers are produced from the sides and ends of the branches, standing on short foot-stalks, having an inflated sheath or cover, out of which the tube of the flower arises, which is seven or eight inches long, and very slender, but at the top is parted into two lips, the under being large, and divided into three broad segments, the middle being larger than the other two; the upper lip is roundish and entire; the flowers are succeeded by oblong fruit, having a thick dry skin, which opens lengthways, inclosing a hard furrowed nut, with two recurved horns.

The second species grows naturally at the Havannah, and some of the other islands in America. This rises with a shrubby stalk to the height of ten or twelve feet, dividing upward into a few branches; the flowers are produced from the sides of the branches, growing several together on the same foot-stalk: they are of a greenish yellow, with brownish spots on the inside; they have a swelling tube, which is recurved, and the brim is slightly divided into five unequal segments.

Culture of the CRANIOIARIA.

The first sort is an annual plant; the seeds must be sown in the spring, upon a hot-bed; and when the plants are fit to remove, they must be each planted in a separate small pot, and plunged into a moderate hot-bed, observing to shade them carefully from the sun till they have again taken root; after which the fresh air may be admitted to them freely, which will prevent their being drawn up weak.

These plants are too tender to bear the open air of our climate, for which reason, when they are grown too large to remain under the frames, they must be removed into the bark-stove, and plunged into the tan-bed, where they will flower, and with good management often per-

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fect their seeds; these should remain on the plant till they drop, otherwise they will not grow; for the outer covers of those seeds split open, and drop off before the seeds are quite ripe.

The seeds of the second species must be sown on a hot-bed in the spring: and when the plants are fit to remove, they should be each planted into a separate small pot, and plunged into a fresh hot-bed, where they must be shaded from the sun till they have again taken root, after which they should have fresh air admitted to them daily. In autumn remove them into the bark-stove, and plunge them into the tan-bed, after which they may be treated in the same manner as other tender plants from the same countries.

CRESS, *Nasturtium*, there are many species of this genus, but the three following are the only ones cultivated in gardens. 1. Cress, with oblong leaves, ending in many points, and an erect stalk; or common garden Cress. 2. Cress, with the lower leaves divided, but those on the stalks oblong and entire, and an erect branching stalk; or broad-leaved garden Cress. 3. Cress, with leaves ending in many points, and trailing stalks; or Swine's Cress.

The first sort is commonly cultivated in gardens as a salad herb; there is a variety of this, whose lower leaves are much curled on the edges; this was formerly cultivated in greater plenty than at present.

The stalks of the second species rise much higher, and branch out more than those of the common sort, and the branches grow more upright; this was formerly much more cultivated than at present.

The curled sort is preserved in gardens for the sake of variety, but the common sort is equally as good for use.

Culture of the CRESS.

The seeds of the common sort must be sown during the winter season upon a moderate hot-bed, and covered with mats or glasses to preserve it from great rains or frost, both which would injure it greatly at that season.

In the spring it may be sown in warm borders, where it must be defended from cold winds. When it is intended to continue all the summer, it must be sown upon shady borders, and the sowing repeated every third day, otherwise it will be too large for use, for at that season it grows very fast.

The curled sort should be sown somewhat thinner than the common sort, and when the plants come up they should be drawn out, so as to leave the remaining ones half an inch asunder, which will give them room to expand their leaves.

In order to preserve the variety with curled leaves distinct, all such plants as appear inclined to degenerate from their kind, must be carefully separated, leaving only such as have their leaves very much curled, being careful not to intermix them together.

When the seeds are ripe, the plants should be drawn up, and spread upon a cloth two or three days to dry, after which the seeds should be beaten out, and preserved in a dry place for use.

Indian CRESS, *Tropaeolum*, a genus of plants, ranged by Linnæus among the *Scandria monogynia*, and of which there are only two species. 1. Indian Cress, with leaves, which are almost divided into five lobes, and obtuse petals to the flowers, called the common, or small Indian Cress. 2. Indian Cress, with entire leaves, and acute-pointed bristly petals to the flowers, commonly called Indian Cress.

Of the first species there are two varieties, one with a deep orange-coloured flower, inclining to red, and the other with a pale yellow flower; it has a trailing herbaceous stalk, garnished with leaves almost circular, they are smooth and of a greyish colour; the flowers come out from the wings of the stalk, standing upon long slender foot-stalks; they are composed of five acute-pointed petals, the two upper of which are large and rounded; the three under are narrow, their tails join together, and are lengthened into a tail two inches long.

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This plant flowers from Midsummer till the frost puts a stop to it in autumn.

The second sort grows naturally about Lima; this has larger stalks, leaves, and flowers, than the former; the borders of the leaves are indented almost into lobes, and the petals of the flowers are rounded at their points. There are two colours of this sort as in the former, and one with double flowers, which is propagated by cuttings, for it does not produce seeds.

Culture of the INDIAN CRESS.

These are annual plants; though they may be continued through the winter, if they are kept in pots, and sheltered in a good green-house.

They are sometimes propagated by cuttings, but the usual method is to raise them from seeds; these should be sown in April, in the places where they are designed to remain, which should be where the stalks may have support: for they will climb six or eight feet high, when they are trained up, and then their flowers make an elegant appearance: but when they trail upon the ground, they soon wither, and their beauty is entirely lost.

Sciatica CRESS. See the article CANDY-TUFT.

CROCUS, *Saffron*, a genus of plants, ranged by Linnæus among the *triandria monogynia*, and of which according to some authors there are four species, but the above-named writer enumerates two only. 1. *Crocus*, with a spatha of one valve near the root, with a very long tube to the flower, being the cultivated or true Saffron. 2. *Crocus*, with a two leaved spatha, and a short tube to the flower.

There are many seminal variations of this flower in our gardens; the description and culture of two or three of them will be a sufficient direction to the gardener for the rest.

The first species is the plant which produces that well-known drug called Saffron; this has a roundish, bulbous root, as large as a small nutmeg; from the upper part of the root come out the flowers, which together with the young leaves, whose tops just appear, are closely wrapped about by a thin spatha, or sheath, which parts within the ground, and opens on one side; the tube of the flower is very long, arising immediately from the bulb, without any foot-stalk, and at the top is divided into six oval obtuse segments, which are equal, and of a purple blue colour. In the bottom of the tube is situated a roundish germen, supporting a slender style, which is not more than half the length of the petal, crowned with three oblong golden stigmas, which is the Saffron.

This plant flowers in October, and the leaves keep growing all the winter, but it never produces any seeds here.

Culture of this CROCUS.

It is propagated by parting the roots; the fibres of these roots perish when their leaves do, and they may therefore, like all other roots of the same kind, be taken up as soon as the leaves appear dead, and laid by in a dry place till the beginning of August, at which time they must be planted again; they should be planted in holes made with a dibble, about two inches deep, and at two inches distance from one another; and rake the earth over them till they are covered about an inch deep.

The leaves are so short when the flowers appear, that it seems produced on a naked stalk, but as that decays they grow to a considerable length; these look but unfightly when the flowers are gone, but they should not be cut, for that greatly weakens the root for the next season's flowering.

Polyanthus CROCUS. This is a most beautiful variation of the common *Crocus*; the root is roundish, white within, and covered with a brown skin; the leaves are numerous: and those, and the bases of the flowers, with the scabbard which rises from this part, and serves them as a cup, unite in a manner together, and form one common body; the leaves are long and very narrow, they naturally grow in an arched form, rising circularly from the base, and drooping at the point: their colour

is a fine deep green, and each has along the middle a line of perfect white.

The flowers rise from the head of this united body, with long tubes, which serve them as stalks and they are large and extremely beautiful; the cluster of them from one head is often eight or ten, and they display themselves in various positions, some upright, some drooping inwards, and others turning out, so that the whole tuft represents a nosegay contrived in the most artful manner. The body of the flower consists of six segments, rising from the tube, and these so large, that they resemble petals; their ground colour is a greyish or pearly white, but they are stained and diversified in the most elegant manner with purple, and crimson; the outer segments usually have the colour deepest, and in greatest quantity; the inner ones are sometimes perfectly white, and sometimes lightly tinged.

Culture of this CROCUS.

Parting of the roots is the common method of propagating it: -but to proceed for ever in this manner, is always to see the same dull round of flowers; the attention of the curious should therefore be employed on the raising them from seeds; this, though slow, will be always found the true method to produce variety. The way to have fine flowers, is to favour the ripening of the seeds; for if they are poor, though they contain the principles of vegetation, little will be produced from them either of beauty or of value. The best plants to fix upon for this purpose, are those in which the flowers are most numerous, and have the strongest purple; these must be chose as soon as the flowers are open enough to shew their beauty, when the gardener must take all the lower flowers off the cluster, leaving only three, or at the most four, of the upper ones to blow to perfection. Let him give the plant a little water every day, and always shade it from the noon sun: this will keep it much longer in flower, and consequently the seeds will ripen gradually. When the flower is fallen, the same care must be taken that the plant may not be hurt: let it have water moderately once in three days; clear away all weeds, and break the earth round about it with a trowel, but not too near the main root. The first week in May the seeds will be ripe. Let the head be carefully taken off, and laid upon a papered shelf, and then prepare the following compost for them.

Mix together a barrow of fresh and light pasture earth, half a barrow of pond mud, a bushel of old cow-dung, and half a bushel of sand: beat and break these all very well together, and sift the whole through a coarse wire sieve, throwing away the lumps, which will be principally the worst part of the cow-dung.

Bore half a dozen holes at distances, in the bottom of a box made of rough boards, and cover them with some coarse gravel, that the water may always have free passage.

Pour in the mould, and set the box upon some brick supports, one brick thickness above ground; clear the seeds from the heads, and spread them at a little distance, when they have lain four days, and the mould in the box is settled, level the surface, and scatter them upon it carefully. The first week in June is the best time for this sowing. The seeds must be covered a finger's breadth with the same compost sifted over them, and the place where the box stands must be open to the morning sun only. When the mould is too dry, it must have a gentle watering in an evening; if very hard rains come, a covering should be hung over the box; and care must be taken to destroy all shoots of weeds as soon as they appear. At the approach of winter the box must be removed to a place where it may have all the sun it can. In spring it must be removed to its former situation, and treated as before.

Thus the foundation is laid for a fine variety of flowers. Weeds and moss are to be cleared off as they rise, and the young plants must have frequent and very gentle waterings.

When the leaves are decayed let some fresh earth be sifted over the roots, about a quarter of an inch in thickness,

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nefs, and toward winter let the box be again removed into its sunny situation. The succeeding summer, when the leaves are decayed, let the mould be carefully broke and loofened in the box. A border must now be dug up for the roots; and the best soil for them is the common garden mould, with some fresh pasture earth dug in among it. Let as much of this soil as will make two inches in depth be kept off, and draw lines lengthways, and across at three inches distance, and the earth well broken that lies out.

Now all the mould which was in the box must be carefully sifted, and the roots taken out. Set one of these upright in the centre of every square marked upon the border by the line; and sift the mould over them which was left out for that purpose.

Thus let them remain, keeping the bed clear from weeds till spring; and then let the mould be carefully and gently stirred at the surface, and a quarter of an inch of fresh sifted on. The same must be done in autumn when the leaves are decayed, and by this method there will be produced an original stock of the finest kinds; among which there is no doubt of meeting with many new ones: after which they may be multiplied by parting the roots, which should be done once in three years.

Their proper management is then as follows; every off-set must be planted in a separate hole two inches deep, made with a trowel, that the mould may lie loose; and those which are intended to produce off-sets should be suffered to remain in the ground the full time already mentioned. The others should be taken up when the leaves are decayed, and planted again in September.

Single and Double CROCUS. This flower is worthy the attention of the curious. The root is roundish, covered with a brown bark, and furnished at the base with many fibres. The leaves are numerous, very narrow, and of a considerable length; they terminate in a point; and they rise, together with the stalks, surrounded by a fine pale membrane. Their colour is a lively but not very deep green; and they have a faint white rib along the middle. The flowers are large and beautiful; they rise from the root with a long tube, surrounded by a thin and ragged membrane; and they are of a most elegant gold yellow: the division, as in the other Crocus's, is into six long and large segments, resembling so many petals; and of these three stand more outward than the others; these three have each a rib of purple running all their length, deeper toward their bottom and paler upwards; and the inner segments have the tips purple. Within the flower stand three filaments of a yellow colour, and tipped with golden buttons; and in the midst of this a single style. The scabbard or film surrounding the lower tube of the flower, is formed of a single piece; and from the body of the flower there run down this tubular part six lines of purple continued from those which run along the segments.

This is the appearance of the flower in its common single state. But when, by art, it is rendered double, the beauty is incomparably greater. The segments become numerous, and their colour a much brighter yellow than in the single flower. The bottoms of the segments often swell out into a kind of arched or rounded buttons; and these are throughout, except for a yellow line along each edge, of a deep purple. The veins of purple run along the segments in greater number, two, three, or more on each; and sending off side branches at small distances, these intermingle among one another, which gives the whole flower a most elegant aspect; and this is the condition in which the Crocus makes its most gorgeous appearance.

Culture of this CROCUS.

The root of this flower will produce off-sets in abundance; but if they have not fresh soil every year, they will decline in lustre. The best method is to raise the plant from seed, the manner of which has been already described in treating of the *Polianthus* Crocus; the only difference is that this kind requires a richer soil, which may be obtained by mixing cow-dung with the mould, as that fertilizes without heating.

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CROWFOOT, *Ranunculus*. See the article **RANUNCULUS**.

Musk-CROWFOOT, *Adoxa*, a genus of plants ranged by Linnæus among the *oelandria tetragynia*, and of which there is only one species.

This is a perennial plant which grows naturally in the woods in England, and most other countries in Europe.

Culture of the Musk CROWFOOT.

It is propagated by parting the roots in autumn, which should be planted in the shade of trees or shrubs; this done it requires no farther care.

CROWN IMPERIAL, a species of the *Fritilaria*. See the article **FRTLILARIA**.

Several varieties of this flower are preserved in curious gardens, but as the same method of culture is proper for them all, we shall only make particular mention of the most elegant, *viz.*

Majestic CROWN IMPERIAL. The root is bulbous, but of a particular form, rounded, thick, and flatted, and is composed of many thick pointed juicy scales; of a yellowish white, more or less tinged with purple, and of a disagreeable rank smell. From this, early in spring, bursts through the mould a vast firm shoot, clustered with leaves, and loaded with buds of many flowers. As the plant advances in height it acquires a more regular form. The stalk rises two feet and a half in height, and is very thick, firm, striated, and green. The leaves are placed irregularly, and in great numbers about the lower part of it: they are long, moderately broad, of a fine green, sharp-pointed, and undivided at the edges. For some space above these leaves the stalk is naked, smooth, of a faint yellowish green tinged with a purplish cast; and frequently spotted very beautifully. At the top stands an elegant head, composed partly of leaves and partly of flowers. The flowers are eight or ten in number, and they rise each between two of those leaves which form the cornuose head. These leaves are placed obliquely upwards, and form a crown like that of the Pine-Apple. The flowers hang down; they are of a deep yellow; and sometimes there run through it stripes of a fainter gold, very pleasing. Each flower has its separate footstalk, sometimes these, with the crown of leaves terminate the whole; but when the plant is in its highest perfection, the main stalk is not terminated by the head of flowers and leaves, but continued through them: and after running up naked and slender to a little height above the tops of the leaves, it has a second smaller crown of leaves and flowers, disposed exactly as the first, but less; and above these there will also sometimes rise a third.

The flowers in these upper stages perfectly resemble those of the lower, but they are less beautiful.

Culture of the CROWN IMPERIAL.

The common method of propagating this plant is by its off-sets; these are produced freely, and they grow with little trouble to perfection; but in this, as in all other instances where there can be varieties obtained, the manner of raising it from seed is much preferable to that of raising it by off-sets.

For this purpose, let the seeds be saved from such plants as are robust, and have a great number of flowers. These must be sown in autumn upon any of the light composts, and the young plants weeded and watered. When their leaves decay, let them be covered with a finger's breadth of the same soil sifted over them. The next year let them be planted at six inches distance in another bed, and there stand to flower. Then mark the finest, and transplant them into a new bed, at two feet distance; and if these double and triple crowned kinds do not appear from this sowing, let the seeds of those selected plants be sown again, and treated with the same care. When the finest of this second sowing have been planted out in their proper beds, let them be propagated by off-sets.

The true management is to take the roots up as soon as the leaves decay, and hardening them in the air, to keep them out of the ground till August. They must then be planted at a yard distance: and this repeated every

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every year, taking off the off-sets, and planting them in a bed in the nursery, till they are of a bigness to flower in perfection.

CUCKOW PINT, *Arum*. See the article ARUM.

CUCULLARIA, a species of the Fumatory. See FUMATORY.

CUCUMBER, *Cucumis*, a genus of plants ranged by Linnæus among the *monoecia syngenesia*, and of which there are seven species, but two only are usually cultivated in our gardens. 1. The common garden Cucumber. 2. The long Turkey Cucumber. The first sort is the Cucumber which is generally cultivated for the table, and is so well known as to need no description. The second sort is the long Turkey Cucumber, which is also pretty well known in England. The stalks and leaves of this are much larger than those of the common sort. The fruit is generally twice the length and has a smooth rind. There are green and white fruit of this, as well as of the common sort, which differ in but little, except colour. The white is less watery than the green, for which reason it is held in greater esteem.

Culture of the CUCUMBER.

To raise early Cucumbers, the generality of gardeners put their seeds into a hot-bed before Christmas, but where there is the conveniency of a stove for raising these plants it is attended with less trouble than a common hot-bed, and is a much surer method, because the plants will have a much greater share of air than under frames; therefore when there is this convenience, the seeds may be sown in small pots, and plunged into the tan-bed, in the warmest part of the stove. The seeds should be at least three or four years old. When the plants are up, and begin to put out their rough leaf, there should be a sufficient number of small pots filled with good earth, and plunged into the bark-bed, that the earth may be warmed to receive the plants, which should be pricked into these pots, two plants in each; but when they have taken root and are safe, the worst should be drawn out, being careful not to disturb the roots of that which is left.

In the management of these plants there must be great care taken not to give them too much water, and it will be very proper to put the water into the stove some hours before it is used, that the chill may be taken off, but there must be caution used not to make it too warm, for that will destroy the plants; they should also be guarded from the moisture which frequently drops from the glasses of the stoves which is very hurtful to these plants while young.

Prepare a proper quantity of new dung for making a hot-bed to receive them. The dung should not be too full of straw; mix it well together, and throw it into a heap, adding some sea-coal ashes to it; after it has lain thus a few days, it should be carefully turned over, and again laid in a heap, repeat this a third time, which will rot the straw and mix it thoroughly with the dung. The place where the bed is made should be sheltered with reed-hedges, and the ground should be dry. Here make a trench of a proper length and breadth, and a foot deep at least, into which the dung should be thrown, and carefully stirred up and mixed, till no part is left unseparated; very often for want of this care a bed settles unequally.

There should also be great care taken to beat the dung down close in every part of the bed alike. When the bed is finished, the frames and glasses should be put upon it to keep out the rain, but there should be no earth laid upon the dung till two or three days after, that the steam of the dung may have time to evaporate. If there should be any danger of the bed burning, it will be proper to lay some short old dung, or some neat's dung, over the top of the hot-dung, about two inches thick, which will keep down the heat. The usual quantity of dung allowed for making the beds at this season, is one good cart load to each light.

In about three days the bed will be in a proper temperature of heat to receive the plants; at which time the dung should be covered over with dry earth about two inches, and in the middle of the bed it should be a

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foot thick. This should be laid upon the dung two or three days before the plants are removed into the bed, that the earth may be properly warmed. Then the plants should be carefully shaken out of the pots, preserving all the earth to their roots, and placed on the top of the earth in the middle of the bed. Two of these plants will be sufficient for each light, and these should be placed at about seven or eight inches asunder, but not all their roots together, as is too often practised. When the plants are thus situated in the bed, the earth which was laid a foot thick in the middle of it, should be drawn up round the ball which remained to the roots of the plants, into which they will soon strike. For the earthing of these beds, there should always be a quantity of good earth laid under cover, to keep it dry, for if it is taken up wet it will chill the beds, and also occasion great damps in them; therefore it is quite necessary to have a sufficient quantity of earth prepared long before it is used.

When the plants are settled they must have proper air and water, according to the weather, being careful, when it is cold, not to admit too much of the former, nor give too much of the latter: the glasses should also be well covered with mats every night, to keep up the warmth of the bed, and some fresh earth should be laid upon it at different times, which should be put at some distance from the roots of the plants, till it is warmed, and then should be drawn up round the heap of earth, in which the plants grow; this should be raised to the full height of the former ball, that the roots of the plants may the more easily strike into it; by this method of supplying the earth the whole surface of the bed will be covered a foot deep with it, which will be of great service to the roots of the plants, for where the earth is very shallow, the leaves will always hang in the heat of the day, unless they are shaded, and the plants will require more water to keep them alive, than is proper to allow them. By thus gradually applying the earth, it will be fresh: and much better for the roots of the plants than that which has been long upon the bed, and has been too much moistened by the steam arising from the dung.

If the heat of the bed should decline, there should be some fresh hot dung laid round the sides of it to renew the heat; for if that should fail at the time the fruit appears, they will fall off and perish, therefore this should be carefully regarded; and when the plants have put out side branches, commonly called runners, they should be properly placed, and pegged down with small forked sticks, to prevent their rising up to the glasses, and also from crossing, and entangling with each other. By thus properly directing them at first, there will be no necessity of twisting and tumbling the plants afterwards, which is always hurtful to them.

When the earth of the bed is laid the full thickness, it will be necessary to raise the frames, otherwise the glasses will be too close to the plants; but when this is done, there must be care taken to stop the earth very close round the sides of the frame, to prevent the cold air from entering under them. The watering of the plants, and admitting fresh air to them must be diligently attended to, otherwise they will soon be destroyed, for a little neglect either of not admitting air, or letting in too much; by over watering, or by starving the plants, will very soon destroy them past recovery.

When the fruit of the Cucumbers are fairly set, if the bed is of a proper temperature of heat, they will soon swell and become fit for use; after which all that is necessary to be observed, is to water the plants properly, which should be done by sprinkling the water all over the bed, for the roots of the plants will extend themselves to the sides of the bed; therefore those who are inclined to continue these plants as long as possible in vigour, should add a sufficient thickness of dung and earth all round the sides of the bed, so as to enlarge them to near double their first width; this will supply nourishment to the roots of the plants, whereby they may be continued fruitful great part of the summer; whereas, when this is not practised the roots of the plants when they have reached the sides of the bed, are dried

by the wind and sun, so that the plants languish and decay long before their time.

In gardens where there is not the convenience of a stove, the seeds, for early Cucumbers, should be sown in small halfpenny pots, and these placed in a well prepared hot-bed, as they can then easily be removed from one bed to another, if the heat should decline; or on the contrary, if the heat should be too great, the pots may be raised up, which will prevent the seed or young plants from being injured thereby. When the plants are come up, there should be a fresh hot-bed prepared, with a sufficient number of halfpenny pots plunged therein, ready to receive them, into which they must be planted in the same manner as before directed; and the after management of the plants must be nearly the same; but as the steam of the hot-bed frequently occasions great damps, there must be care taken to turn and wipe the glasses frequently, to prevent the condensed moisture falling on the plants, which is very destructive to them. Air must be admitted at all proper times, when the weather is mild; and the bed must always be kept in a proper temperature of heat; for the want of fire must be supplied by the heat of the dung. They may afterwards be treated in the manner already directed.

The seeds for the second crop should be sown about the middle of March, or a little later if the spring is backward, either under a bell-glass, or in the upper-side of your early hot-bed, and when the plants are come up, they should be transplanted into another moderate hot-bed, at the distance of about two inches asunder; here they must be covered with bell or hand-glasses, set quite close to each other, and they should be shaded and sparingly watered, until they have taken root; they should also be aired as much as the weather will permit, by raising up the glasses on the opposite side from the wind, in order to strengthen them; and when they have begun to put out their rough leaves, they must be again transplanted on the ridges where they are to remain.

These ridges are made with new horse-dung, in the same manner as before directed for the hot-bed, excepting that they are neither so thick nor so wide. About two feet four inches will be sufficient for the trenches in which they are made; but their length may be whatever is most convenient, according to the number of plants intended for them. The trenches for these ridges should be about ten inches deep in dry ground; but if the soil is wet, very little earth need be dug away.

About one cart load of dung will make a ridge long enough for five or six holes of Cucumbers, at the distance of about three feet and a half from each other; this ridge of dung being well beaten down and levelled at top, should be covered with earth about four inches deep, and the same thickness of it should be laid over the sides. Hillocks of mould should then be raised up in the middle of the ridge, at every distance in which the plants are to be set; and after these have been closely covered with the glasses during twenty-four hours, in order to warm the earth, and thereby fit it for the reception of the plants, they should be stirred up with the hand, so as to make a little hollow in the middle of each, in the form of a basin; four plants should then be set as far as can be from each other, in each of these hollows, where they must again be watered and shaded till they have taken fresh root; after which the air must be admitted, by raising the glasses as before directed, in proportion to the warmth of the weather: but they should be raised thus only in the middle of the day, till the plants begin to fill them; for after that, they should be propped up with a forked stick on the south side, to a height proportioned to the increase of the plants, which must be carefully preserved from being scorched by the sun. This will also harden and prepare them for the open air, to which they should not, however, be exposed too soon, because we frequently have morning frosts in May, which they would not be able to resist. Rather than run any hazard of this kind, the glasses should be kept over them as long as possible without damaging the

plants; and this may be for a considerable time, if the glasses are raised all round, by setting them on three bricks.

About the end of May, when the weather begins to be settled and warm, and rather in a cloudy day which seems to promise rain, than in a very dry and sunny one, the plants should be gently turned down from out of the glasses; and these should then be supported over them at the height of four or five inches from the ground, by three forked sticks, which will hold them up very securely, and prevent their bruising the shoots of the plants underneath: for it is best not to remove the glass entirely before the latter end of June or the beginning of July, because they will preserve a moisture about their roots much longer than if they were quite exposed to the open air. The plants thus turned down will have made a considerable progress by the end of three weeks, especially if the weather has been favourable; and then it is that the spaces of ground between the ridges, or along the sides of the ridge if there be but one, should be dug up, and added to the bed, or beds, that the roots of the plants may be enabled to strike into it; for they will extend themselves a great way (some say as far as the vines,) if they are not cramped. The runners of the vines should be laid in exact order, without tumbling them too much, or breaking their leaves. Some pin them down gently with little wooden hooks, to prevent their being blown about by the wind. After this, they will require no farther care, except keeping them clear from weeds, and watering them when necessary, that is to say, when their greater leaves drop and hang down to the ground. But here it is to be observed, that though pretty frequent watering of them increases their fruitfulness, they are best tasted, and wholesomest, when they have had but little water; and, though they should be watered sometimes in dry weather, they should be carefully defended from rain when it is cold. The ridges thus managed will yield large quantities of fruit, from June till the latter end of August. Mr. Mortimer recommends nipping of the top shoots of Cucumber plants after they have put out three or four joints, as a means of making them knit the sooner for fruit.

It is from Cucumbers planted on ridges, like the above, that most of the gardeners about London save their seeds. To this end, they leave a number of the earliest and finest fruit upon the vines, until their seeds are perfectly ripe; and then, when the outer cover begins to decay, they cut them open, and scrape out their seeds, with the pulp, into a tub, which they cover over with a board, to keep out all filth. They let these seeds and pulp remain thus for eight or ten days, only stirring them well with a stick, to the bottom, every day, in order to rot the pulp, and make it separate the more easily from the seeds. They then pour water into the tub, and stir the whole well about, till there arises a scum, after which they let the seeds settle to the bottom, and pour off the water. This they repeat two or three times, till the seeds are perfectly cleared from the pulp. They then spread them upon a mat exposed to the sun and open air for three or four days, till they are quite dry, and after this they put them into bags, and hang them in a dry place, where vermin cannot come to them. They will keep good for several years, but are thought to produce the least luxuriant, and therefore most fruitful plants, when they are three or four years old.

To avoid the trouble of making beds, or ridges, of dung on purpose for them, as above described (which is undoubtedly the surest way to have early fruit), many people, who are less solicitous about the earliness, or even the great plentifulness of these crops, than the trading gardeners about London are obliged to be, only dig holes of the size of a bushel, fill them with warm stable-dung, then set in the middle of them four or five Cucumber-plants, with as much mould as possible about their roots, and afterwards earth them up in the form of a basin, to render the watering of them more effectual. They shade them till they have taken root, and cover them for a while with bell or hand-glasses, if they have any; or they even trust them at once to the open air.

If the plants thrive, three of them will be sufficient in a hole; and then the rest of them may be plucked up, or transplanted elsewhere. Some even raise them from their seeds planted in holes of this kind, without any previous hot-bed, and they do very well, if the season be at all favourable.

The time for sowing the latter crop of Cucumbers, commonly called picklers, is the beginning of June. The London gardeners generally set these between their widest rows of Cauliflowers, which are four feet and a half asunder. To this end, they dig square holes about three feet and an half from each other, breaking the earth well, and hollowing the surface of each hole, with their hands, till it is like a basin. They then plant eight or nine seeds in the middle of each of these spots, and cover them with earth to the thickness of about half an inch. If the weather is very dry, they water them gently at the end of a day or two. In five or six days the plants will appear above ground; and particular care must be taken then to defend them from birds, especially sparrows, which will otherwise soon pinch them off, and thereby frustrate all expectations of a crop: but this danger will be over in little more than a week; for the sparrows will not meddle with them after they have expanded their seed leaves. Care must also be taken to continue to water them gently, from time to time, according as the season is more or less dry; and when they begin to shew their third leaf, which is the first of their rough ones, all the weakest plants should be pulled up, leaving in each hole only four of the most promising and best situated. The ground about these should then be well stirred with a small hoe, to destroy the weeds, and earth up the plants, around the stems of which the mould should afterwards be gently pressed down by hand, the better to separate them from each other as much as can be without hurting them. This being done, they are watered a little to settle the earth about them, and at such other times as the dryness of the weather may render necessary: but, above all, they must be kept clear from weeds. When the Cauliflowers are quite removed, the whole ground should be thoroughly hoed and cleaned, fresh earth should be laid up around the plants, so as to deepen the hollows in which they stand, that they may the better contain water when it is given them, and their vines should be spread out carefully in the order they are to run, in such manner that they may not cross or be entangled with one another. A little earth should then be laid, and gently pressed down, between the plants, the better to separate them every way, and a gentle watering now, and as often afterwards as the season shall require, will forward their growth. With this management, these plants will begin to yield young Cucumbers, fit for pickling, about the latter end of July, or early in August.

About fifty or sixty of these holes will be necessary for a middling family; because a smaller number of them will not afford fruit enough at one gathering to requite the trouble and expence of pickling, and they never are so good if they are gathered long before they are put into the vinegar. Fifty holes will seldom furnish more than two hundred Cucumbers fit to gather at a time; and this may be repeated twice a week as long as the season lasts, which generally is five weeks. What are not wanted for pickling, may be left to grow till they become fit to eat.

M. de Chateauvieux has raised excellent melons, which are a much more tender fruit than Cucumbers, in beds of common earth, in the open fields, merely by keeping the ground in fine order by a judicious use of the horse-hoe, without the help of either dung, hot-bed, or glasses over them, and they were, in all respects, preferable to any in his garden. This surely merits the attention of all kitchen gardeners, and singularly of those near London, where land and labour bear extraordinary prices.

A correspondent of the editors of the *Museum Rusticum* has given us the following new method of raising Cucumbers, without the help of forcing frames, though the fruit are much finer than any raised by the other

methods yet in use. "I procured, says he, some of the best seed of the common prickly Cucumbers I could get; and from this seed, in the spring of the year 1750, I raised some plants on a moderate hot-bed, not hurrying them too much in their growth.

"In May, when the danger of the frost was almost over, I familiarized the plants by degrees to the air, and towards the latter end of the month planted them in the open ground against a south wall.

"In this situation they throve apace, and as fast as they put forth their runners, I nailed them gently up against the wall. They did not send forth many blossoms till they had run a considerable height, at least five feet; after which the fruit began to shew itself.

"I did not give my plants too much water, and this I have since found a necessary precaution.

"The fruit increased in size daily, was of a fine green colour, and differed greatly from that of some other plants raised from the same seed, but planted in the common way; the runners being suffered to trail on the ground.

"When I gathered my first Cucumber, I was exceedingly delighted with its appearance. It was long, thin in proportion to its length, of a beautiful green, not too deep, with a whitish summit.

"When I cut it I found the flesh thick and firm, but few seeds, and those very small, and its flavour extremely delicious.

"Desirous of knowing whether the plant might not be improved by sowing the seeds of fruit raised in this manner, I pitched upon some of the finest Cucumbers, not at too great a distance from the roots, and left them on the vine to perfect their seed.

"In this manner I have raised Cucumbers for my own use ever since, and have the satisfaction to find, that instead of degenerating, they have improved surprisingly.

"My neighbours in the country are exceedingly glad when I have any seed to spare for them, and always find their Cucumbers that year much better for using it, though they do not grow so large as mine, neither have they so delicious a flavour, unless nailed up against a wall.

"I am very sensible that this method cannot, with any degree of convenience, be brought into general practice; yet, in every garden, a few plants may be so trained to prevent the seed from degenerating; especially as one or two plants raised in this manner would supply a sufficient quantity of seed for a large garden.

"I must own, that in my method the plants do not bear so great a number of Cucumbers as in the common way; but then they are, without comparison, larger, and of an exquisite flavour." *Museum Rusticum*, vol. I. page 131.

Wild CUCUMBER, Elaterium, a species of the *Momordica*, or Male Balsam Apple.

This plant is also called Spurring Cucumber, from its casting out its seeds, together with the viscid juice in which they are lodged, with a violent force, if touched when ripe, and from hence it has sometimes the appellation of *touch me not*. This plant grows naturally in some of the warm parts of Europe, but it is cultivated in our gardens for the fruit, which is used in medicine. It has a large fleshy root, from which come forth every spring, several thick, rough, trailing stalks, which divide into many branches, and extend every way two or three feet; these are garnished with thick, rough, and almost heart-shaped leaves, of a grey colour, standing upon long foot-stalks. The flower comes out from the wings of the stalk; and the fruit grows of an oval form, about an inch and a half long, of a grey colour, like the leaves, and covered over with short prickles; these do not change their colour when ripe, like most of the other fruit of this class; but if attempted to be gathered, they quit their foot-stalk, and cast out their seeds and juice with great violence; therefore, when the fruit is designed for use, it should always be gathered before it is ripe, otherwise the juice, which is the most valuable part, will be lost; for the *Elaterium*, which is made from

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from the clear juice of the fruit, is much whiter, and will retain its virtues much longer than that which is extracted by pressure.

Culture of the Wild CUCUMBER.

If this fruit is permitted to stand till ripe, it will burst, and the seeds be scattered round to a considerable distance, when there will be plenty of the plants produced the next spring. Or if the seeds are sown upon a bed of light earth, the plants will come up in about a month after, and may be transplanted to an open spot of ground, in rows at three or four feet distance, and almost as far asunder in the rows. If these are transplanted while young, there will be little hazard of their growing; and after they have taken new root, they will require no farther care, but to be kept clean from weeds.

If the ground is dry in which these are planted, the roots will continue three or four years, unless the winter should prove very severe, which will sometimes kill them.

CUDWEED, GOLDY-LOCKS, or ETERNAL-FLOWER, *Gnaphalium*, a genus of plants, ranged by Linnæus among the *syngenesia polygamia superflua*, and of which he distinguishes no less than thirty-six species, too great a number for particular description in this work. The most beautiful among them is the Golden Cudweed; the root is long, and furnished with innumerable fibres; the stalk is thick, round, firm, white, and woolly, and rises to two feet in height, spreading every way innumerable branches, which stand wide, loose, and scattered; the leaves are large, oblong, and of the same woolly aspect with the stalk; they surround it at the base, are broadest toward the middle, waved at the edges, and obtuse; the flowers crown the extremities of all the branches, and on the principal of them form large and handsome heads. They are of a very delicate yellow, bright and shining, and have the additional value of being very lasting.

Culture of the Golden CUDWEED.

This plant is a native of Africa, and thrives there in light, deep, and mellow soils, where there is some moisture. With us it requires the same light deep mould, and will live through winter in the well-sheltered borders of the garden.

Mix a compost of equal parts of pond-mud and garden-mould, and dig this in two spades depth in some small spot, which has a sheltered situation.

On this sow some of the seeds which have been well-ripened and well hardened; such a spot is preferable to the nursery for sowing the seeds in, because the success of the plant depends upon its not being removed.

When the young plants appear they must be thinned to a foot distance, and from this time weeded and watered. April is the best time for putting the seeds into the ground, and they will flower late the same summer, but they will not come to their full perfection till the succeeding year. After this there should be a fresh sowing every season; for the plants are never so beautiful as the first time they come into full flower.

Bastard CUDWEED, *Micropus*, a genus of plants, classed by Linnæus among the *syngenesia polygamia necessaria*, and of which there is only one species.

This is an annual plant, which grows naturally in Portugal, near the sea. It is esteemed in our gardens for the beauty of its silvery leaves. The root sends out several trailing stalks, about six or eight inches long, which are decorated with small, oval, silvery leaves, whose base embrace the stalk. The flowers come out from the wings of the stalks in small clusters; they are white and very small. It flowers in June and July, and the seeds ripen in autumn.

Culture of the Bastard CUDWEED.

If the seeds of this plant are sown in autumn, or are permitted to scatter, the plants will come up in the spring, and will require no other care but to be kept clean from weeds, and thinned where they grow too close. When the seeds of this plant are sown in spring, they seldom ripen the first year.

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CULM, the stalk of grasses and gramineous plants.

CUMIN, *Cuminum*, a genus of plants, of which there is but one species.

This plant is annual, perishing soon after the seeds are ripe; it seldom rises more than nine or ten inches high in Malta, and other warm countries where it is native; but here it never exceeds four inches. These plants flower extremely well in England, but seldom produce seeds. The leaves are divided into long narrow segments, they are of a deep green, and generally turn back at their extremity. The flowers grow in small umbels at the top of the stalks; they are composed of five unequal petals, which are of a pale blueish colour, and are succeeded by long-channelled aromack seeds.

Culture of the CUMIN.

Sow the seeds in small pots, and plunge them into a very moderate hot-bed. When the plants appear, inure them by degrees to the open air; then turn them out of the pots, preserving the ball of earth to their roots, and plant them in a warm border of good earth; by this method the plants will flower extremely well, and in very warm seasons may be brought to perfect their seeds.

CUNONIA, a genus of plants, for which there is no English name, and only one species.

This plant is a native of the Cape of Good Hope. It has a compressed bulbous root, covered with a brown skin; from this rise several narrow sword-shaped leaves, about nine inches long, and a quarter of an inch broad, terminating in acute points; their colour is a fine sea-green. In spring the stalk rises from between the leaves, which is round, strong, and jointed; at each joint is situated a single leaf, which almost embraces the stalk, which rises near a foot and a half high, and is generally curved two opposite ways. The upper part of the stalk is terminated by a loose spike of flowers, of a beautiful soft scarlet colour; these make a fine appearance about the latter end of April, or beginning of May.

Culture of the CUNONIA.

This plant is easily propagated by off-sets, which it sends out in great plenty; or by sowing the seeds; these should be sown in pots, about the middle of August, and placed in a situation where they may enjoy the morning sun. In September the pots may be removed to a warmer situation, and in October they must be placed under a frame, where they may be protected from frost and hard rains, but in mild weather enjoy the free air. The plants will appear in October, and continue growing all the winter. In June their leaves will decay; then they may be taken up, and planted in half-penny pots, and sheltered all the winter under a hot-bed frame, admitting the air at all times when the weather will permit; and the third year they will flower.

CURRENT-TREE, *Ribes*. Of this genus there are four species. 1. Currant, without thorns, smooth hanging bunches, and plain flowers; common Currant. 2. Smooth Currant, with erect bunches, and bractæ longer than the flower, called Sweet Alpine Currant. 3. Currant, without spines, having hairy branches, and oblong flowers; Black Currant. 4. Currant, with unarmed smooth branches, and bell-shaped flowers.

The first sort grows naturally in the northern parts of Europe, but by long culture has been greatly improved, so that at present there are the following varieties in our gardens. The common Currant, with small red fruit; the same with white fruit, and another with pale fruit, commonly called the Champaign Currant; but since the two sorts of Dutch Currants have been introduced, the old red and white Currants have been almost banished.

The second sort is kept in a few gardens for the sake of variety, but the fruit being very small, and of an indifferent flavour; it is not much cultivated.

The third sort grows naturally in Helvetia, Sweden, and other northern countries. The fruit of this plant having a strong disagreeable flavour, is never admitted to table; but being made a jelly, is an excellent remedy for a sore throat, and has often been given with success in quinies.

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The fourth sort grows naturally in Pennsylvania, this is not, as many have supposed, the same with the common black Currant. The plants do not produce much fruit, nor is that so good as to merit cultivation, so that it is only kept by way of curiosity.

Culture of the CURRANT-TREE.

The several kinds of Currants are very easily propagated, by planting their cuttings any time from September to March, upon a spot of fresh earth, which in the spring must be carefully kept clean from weeds; and in dry weather, the young plants must be frequently watered. When they have stood about two years in this place, they will be fit to transplant to the places where they are to remain, and this should be done when the leaves are just decayed; that they may have time to take root before winter. If they are for standards, they should be planted in rows of ten feet distance from one another, and four feet asunder in the rows; but the best method is to train them in espaliers, in which state they take up much less room and their fruit will be far superior. In espaliers they should be placed at ten or twelve feet distance, and all their branches trained horizontally. They are to be allowed the same distance when set against walls or pales.

Those set against a south wall ripen their fruit near three weeks sooner than those in the open air; and those which are planted against a north wall will be proportionably later; so that by this method the fruit may be continued a long time in perfection; especially if those against the north pales are matted in the heat of the day.

These plants produce their fruit upon the former year's wood, and also upon small snags which come out of the old wood; so that in pruning them, these snags should be preserved, and the young shoots shortened in proportion to their strength.

Currant-trees will thrive in any soil or situation, but the fruit is always best when they are planted in a dry soil, and an open spot of ground.

CUSPIDATED Leaf, &c. Such as is pointed like a spear.

CUSTARD Apple. See the article *Custard APPLE*.

CYCLAMEN, Sow-bread, a genus of plants ranged by Linnæus among the *pentandria monogynia*, and of which there are only two species. 1. Cyclamen with flowers reflected back, or the European Cyclamen. 2. Cyclamen with the limb or extremity of the corolla nodding, or the Indian Cyclamen. From these two species, culture has produced a great number of varieties. Among which are the Violet Cyclamen, the round leaved Cyclamen, and the Persian Cyclamen.

Violet CYCLAMEN. The root of this is very large, and black on the outside. The leaves are numerous and not inelegant; they are large, oblong, angulated in various manners, and waved or indented at the edge. Their colour on the upper side is a deep green, with some spots of white; on the under part they are purple or crimson: they stand on long, thick, but not strong reddish footstalks. The flowers rise singly on long naked footstalks; they are large, and of a beautiful violet blue.

Culture of this CYCLAMEN.

It is very hardy, and will bear all seasons in our open borders. The true method of propagating it is by seed: this should be saved from the finest flowers, and sowed on a piece of ground in the nursery, open to the morning sun. Though in this method the progress of the plant to perfection is very slow, yet it is the only one by which beautiful flowers can be obtained. The finest are to be preserved for the distinct beds, the rest dispersed in less conspicuous places, and once a year they should be all taken up and planted in new mould.

Round leaved CYCLAMEN. This is a great ornament to our gardens at a season when few flowers can be had to grace the open ground. The root is large and tuberous. It has no common stalk for leaves and flowers, as in the generality of plants; but each leaf and each flower rises directly from the root upon its proper footstalk. Those of the leaves are purplish, long, weak, and slender. The leaf itself approaches to round; but it is deeply divided for the reception of the stalk,

which adheres in the common way to an indented edge, not as in some round leaves, to the centre. Their colour on the upper side is a fine deep green spotted with white, and on the under side a deep red, between purple and crimson. The veins are large and conspicuous; and they are throughout of a pale crimson. The footstalks of the flowers exceed those of the leaves in length, and are usually more erect. They are as slender as the others; and their colour, which is red at the bottom, becomes toward the top and whitish. The flowers stand singly, one on each of these stalks; and their colour is a deep purplish red.

Culture of this CYCLAMEN.

In the beginning of June the seeds must be collected from some of the plants, and laid on a papered shelf to dry. In a few days they will burst, and the seeds will fall out, if any should remain they must be shaken out; and spread upon the same shelf to harden. The latter end of August a border must be prepared for them in the following manner. Dig out the mould two feet deep, and throw in large gravel enough to cover the bottom two or three inches; then put in the mould again; level the surface, and scatter the seeds over it, so that they may lie at about an inch distance. Sift over them a quarter of an inch of the same mould, and throw on some pieces of furze bushes.

If the succeeding time should be dry, let the bed have now and then a little water. After this the plants will rise without any farther care except that of keeping them clear from weeds. They should be thinned where they rise too close; and such as are taken up for this purpose, should be planted in more vacant spots. They must remain in this bed till the time of their flowering, which will not be till about the fourth year. Then the best are to be marked, for there will rise many varieties; and when the leaves which succeed their flowers are faded, which will be toward the latter end of June following, they must be taken up, and planted out in different parts of the garden, leaving as many as can conveniently stand in the original bed. Their distance in this should be about two feet; for, in a number of years, their roots will grow to a very large size. After this they require no particular care. They bear all seasons, and flower in more profusion every succeeding year, as their roots increase in bigness.

Persian CYCLAMEN. This plant is well worthy the culture it demands. The root is tuberous, and the leaves scatter themselves wildly from it, on long purple footstalks, some erect, some drooping, and others lying on the ground. Their form is oval, with two, and sometimes more indentings, which divide the broad base from the smaller extremity, and part the whole into three rounded lobes. Their colour is a fine strong green, a little tinged with blue. The ribs are of a fainter colour than the footstalk; and the same colour glows under the whole leaf. Among these appear the stalks of the flowers; these are of a paler red than those which bear the leaves, and more than twice their length; they rise naked from the root, and each supports one flower of great beauty; it is large and hangs drooping. The general colour is white; sometimes tinged with a fleshy purple, and always ornamented at the base, with a circle or ring, of a deep purple, rich, and velvety.

Culture of this CYCLAMEN.

This plant is raised from seeds, and the best method is to sow them in a box of rough boards made four feet long, three feet broad, and eight inches deep. Mix up some pasture mould with one third earth from under a wood-pile, and one sixth rotted cow-dung. Blend these well together, throw it in a heap, and sometimes turn it. Save the seeds from some well growing plant, lay them on a papered shelf to harden, and then tie them up in bags till September, at which time the box must be filled within an inch of the rim with the compost: scatter on the seeds, and sift over them a quarter of an inch of the same mould. Set the box in a place where it will have the full sun all the winter; and pick off any moss or young weeds that appear.

In spring the surface will be covered with young plants

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plants. Let the box then be removed into a shady place, where the sun comes only two hours in a morning. In April, if the plants crowd each other a few must be pulled up. At times give them gentle waterings; and in this manner nurse them till they are fit for transplanting. Against this time make some fresh compost of the same ingredients as the first, and with it fill as many pots as you intend to preserve plants. Carefully take up the finest of them, and plant one in each pot. The season for this is in summer, when the leaves are decayed. Set the pots in a shady situation till the plants begin to shoot again: then they must be removed to a warmer part; and at the approach of autumn taken into the greenhouse; here they will flower about December, and with due care will continue full of beauty till late in the spring. They should always be watered sparingly at times, and, unless seeds are wanted, the stalks should be cut down when the flowers are faded, to promote a succession of new bloom.

CYME. *Cyma*, a receptacle that runs into long fastigate peduncles, proceeding from the same universal centre, but with irregular partial ones.

Scarlet CYNOMORIUM. There is scarce a more singular or more beautiful plant than this. It is about eight inches high; and under different circumstances of growth, it appears in various forms; but when the soil and situation favour its flowering, the whole assumes a tolerably regular and constant figure. The root is a light, roundish, and irregular lump, lodged at a small distance below the surface: and, when it is imperfectly nourished, the whole plant often lies upon, or in part under the mould, in several thick irregular pieces with large heads. From this root rises the body of the plant, small at the bottom, thicker upwards and at the extremity somewhat less again. At its first appearance the whole substance is covered with little scales, thick set by one another, and of an oval pointed form, sharper toward the bottom of the plant, and thinner upwards. In this form it stands a considerable time a crimson lump, shewing itself about three inches above the surface of the ground; but when it rises to flowering, the growth from that to its full height is very quick. This lower part retains its delicate crimson and thick scaly covering, but the rest is of a fine scarlet, lightly covered with loose and broader scales, usually indented at the top: these retain something of the crimson tinct of the lower scales, while the naked substance between them is of this fine scarlet; and from this naked part from under the scales, and often without them, rise the flowers covering the whole substance. These are very small, and of a pale flesh colour.

Culture of the CYNOMORIUM.

The first article toward raising this plant, must be to get good seeds, and these must be obtained from the Levant. Let a compost be made of two parts meadow-earth, and one part large coarse sand; and wet it a little with brine. In spring fill a middle-sized pot with this compost, and scatter some of the seeds on the surface; sift a little more of the same mould over them, and place the pot in a bark-bed.

No particular care need, after this, be bestowed upon them: they may take their chance among the other pots of stove-plants; and if they never flower, there will still be great singularity and beauty in them, but if they do, there will be a certainty of continuing them; for their seeds will not fail to grow in the same place where they ripened.

CYPRESS-TREE, *Cupressus*, a genus of plants ranged by Linnæus among the *monoecia monodelphia*, and of which he reckons but three species. 1. Cypress with imbricated leaves and quadrangular branches, or the common Cypress-tree. 2. Cypress with leaves on two sides the branches, commonly called deciduous Cypress. 3. Cypress with imbricated leaves, and branches standing two ways.

The first species is a native of Crete. This tree is found in most of our old gardens; but at present is less regarded than it really deserves. It adds a considerable beauty to wildernesses, and clumps of evergreens, and is

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also worthy cultivation on account of its wood, which is very valuable.

The second species is a native of Virginia, Carolina, and other parts of North-America, where it rises in watery places to the prodigious height of seventy feet, and upwards, and is several fathoms in circumference. The third species is also a native of North-America where it rises to a considerable height, and affords an useful timber to the inhabitants for many purposes.

Culture of the CYPRESS.

All these species are propagated from seeds, which should be sown early in the spring on a bed of warm, dry, sandy earth, which should be levelled very smooth. If the weather proves warm and dry, it will be proper to water the bed, taking care not to wash the seeds out of the ground. In about a month's time, the plants will appear above ground, when they should be kept clear from weeds.

After remaining two years in this bed, they may be transplanted into a nursery; the best season for removing them is in April, on a cloudy day that seems to threaten rain; and in taking them out of the seed bed, the roots should be preserved entire, with a bail of earth to each plant. When they have been three or four years in the nursery, they may be planted out where they are to remain; and if designed for timber, the distance of eighteen or twenty feet should be allowed every way round them. They must be well watered at first to settle the earth to their roots, which ought to be frequently repeated, if the weather proves dry.

The first species seldom produces good seeds in this country; the cones should therefore be brought over entire from the places where it is a native, and the seeds taken out just before they are sown. The best method of getting the seeds out is to expose the cones to a gentle heat, which will make them open and emit their seeds.

Summer CYPRESS, or *Belvidere*, a species of the Goose-foot or wild Orach.

This is a most beautiful plant; it grows very close and thick, and in as regular a pyramid as if cut by art. It has, at first, greatly the appearance of the Cypress-tree, but the leaves are of lively, and more elegant green.

Culture of the Summer CYPRESS.

The seeds should be sown in autumn; in spring, when the plants are come up, they should be transplanted into pots of good earth, and well watered in dry weather: these plants make a handsome appearance, when placed among others to adorn court-yards, &c. till their seeds begin to swell and grow heavy, which weigh down and displace their branches; the pots should then be removed into a retired part of the garden to perfect their seeds; which if permitted to fall upon the ground, will come up the next spring; and no farther trouble is required in the culture, than to transplant them where they are intended to grow.

CYTISUS, *Base-tree Trefoil*, a genus of plants ranged by Linnæus among the *diadelphia decandria*, and of which there are eleven species. 1. Cytisus with single pendulous bunches, and oval oblong leaves, commonly called Laburnum. 2. Cytisus with single erect bunches, and oval oblong leaves, or long spiked Cytisus. 3. Cytisus with erect bunches, the cup augmented by a triple bractæa, and sessile floral leaves. 4. Cytisus with erect spikes of flowers proceeding from the sides of the branches, spear-shaped, woolly leaves, and footstalk of the middle one the longest. 5. Cytisus with single lateral footstalks to the flowers, and hairy, trifid, obtuse, ventricose, oblong cups. 6. Cytisus with flowers collected in heads, and branches lying on the ground. 7. Cytisus with lateral bunches of flowers, angular bunches, and wedge-shaped small leaves. 8. Cytisus with single, spear-shaped, narrow leaves, and angular branches. 9. Cytisus with lateral flowers, hairy leaves, and an upright, striated stalk. 10. Cytisus with sessile flowers, hairy leaves, and an herbaceous stalk. 11. Cytisus with pinnated leaves.

Broad-leaved, pendulous-flowered CYTISUS, or *Laburnum*. This plant is a native of Switzerland and many other parts of Europe; it rises to the height of a moderate

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moderate tree. The trunk is covered with a brown bark; the wood is white and firm; and the young shoots are slender and of a pale green. The branches are numerous; so that the tree naturally forms itself into a handsome head, and the leaves cloath it with a great deal of beauty. These are placed in the trifoliate manner; and the footstalk is long, slender, weak, and covered with a light soft down. Each of the three leaves is oblong, broad, rounded at the end, and undivided at the edges. Their colour on the upper side is a very beautiful fresh green, and on the under part greyish. The flowers are numerous and very handsome; a long series of them hangs on a weak and drooping stalk; they are separately large, and of a delicate yellow. Their common stalk is tender, downy, greyish, and with us five inches long, on this the flowers are placed irregularly, each upon its separate short footstalk. The upper petal, which is larger than the others, has some blackness within, which gives a great elegance to the open flower.

Culture of this CYTISUS.

This plant thrives best in a rich soil, and where, with moderate moisture, there is most sun. It must be raised from seeds, which grow freely in the open air of our climate; seeds ripened here will raise good trees: but when they can be obtained fresh from Italy, such will be greatly preferable; they should be kept dry till March, when the gardener must dig up a small piece of rich ground in the seminary, and sow them, but not too close; sift half an inch of good light mould over them, and scatter upon the surface a few pieces of furze-bush.

In the beginning of April the young plants will appear, and the bushes must then be taken off. A fortnight after this let them be weeded carefully by hand, and thinned where they crowd one another. After this weeding give them a gentle watering; and, unless rain should render it unnecessary, this must be repeated once in three or four days. All summer they should be kept clear from weeds: and at the approach of autumn a reed-hedge must be placed for their defence against cold winds. In the beginning of the March following transplant them into another bed, at two feet distance, leaving as many seed-plants unremoved as will stand with the same space between them in their original bed. They may now stand two, three, or four years, and then will be fit to remove into the garden, where they are to remain among the flowering shrubs.

Long-Spiked CYTISUS, or LABURNUM. Though all the species of this genus are an ornament to our gardens, this from its singular beauty claims the pre-eminence. The root is woody, blackish, spreading, and hung with a few strong fibres. The stem is woody, and about an inch in diameter, five feet high, and naturally spreading into many branches; and if rightly trained, it makes a good head, and an elegant figure. The bark is brown, the young shoots are green, with a tinge of reddish: and toward the tops they have a silken down. The leaves stand three upon each foot-stalk, except that at the summits of the branches, near the spikes of flowers, there usually are a few single ones, slight, and imperfect, and with scarce any foot-stalks. The stalks of the others are tinged with brown, where they join the branch; the separate leaves are of a figure approaching to oval, but too long for that name, and they have a strong brownish middle rib. Their colour is a deep dusky green upon the upper side, and they are hairy and pale underneath; the flowers are extremely conspicuous and beautiful; when the shrub is well-managed, they terminate all the branches, and the whole head appears of gold; they are arranged in very long upright spikes, and their colour is the most glorious yellow that can be conceived; they are not small in themselves, and in the spike are very noble; they stand close, crowding one another, and open in a long succession.

Culture of this CYTISUS.

The same directions which have been already given for the culture of these species, is proper for this also.

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The seeds shoot freely, and being a native of Europe, it bears our winters. It requires moderate waterings, and the soil fresh pasture-ground.

The third, fifth, sixth, eighth, ninth, and tenth species may all be cultivated in the above manner.

The fourth, seventh, and eleventh species, are natives of the Indies, and too tender to bear the open air of our climate. They must therefore be raised from seeds sown on a hot-bed, and, when the plants come up, they must be transplanted each into a separate pot, and placed in the bark-bed of the stove, always allowing them a great share of fresh air in warm weather. They must have but little water in winter, and may in other respects be treated in the manner of tender exotics from the same climate. If they have a proper heat, they will grow four or five feet high the first year, and the second they generally produce their flowers and seeds.

Canary CYTISUS, a species of Broom. See the article BROOM.



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DAFFODIL, *Narcissus*. See the article NARCIS-

sus. *Lily DAFFODIL, Amaryllis*. See AMARYLLIS.

Sea DAFFODIL, Pancratium, a genus of plants ranged by Linnæus among the *hexandria monogynia*, and of which there are seven species. 1. Sea Daffodil with one flower in a sheath, and with reflexed petals. 2. Sea Daffodil with two flowers in a sheath. 3. Sea Daffodil with many flowers in a sheath, and spear-pointed leaves. 4. Sea Daffodil with many flowers in a sheath, plain leaves, and tongue-shaped petals. 5. Sea Daffodil with many flowers in a sheath, narrow leaves, and stamina the length of the nectarium. 6. Sea Daffodil with many flowers in a sheath, sword-shaped leaves, and stamina longer than the nectarium. 7. Sea Daffodil with many flowers in a sheath, and oval, veined leaves.

The several species of this plant are perennial, and have bulbous roots. The first, second, third, fifth, and seventh species are natives of the Indies. The fourth sort grows naturally in the south of France, and the sixth is a native of Sicily.

Culture of the Sea DAFFODIL.

The first, second, third, fifth, and seventh sorts will not succeed in our climate, unless they are placed in a warm stove; they are propagated by off-sets from the roots, and also by bulbs which succeed the flowers; they should be planted in small pots filled with light kitchen-garden earth, and plunged into the bark-bed of the stove, where they will soon put out roots and leaves, and, with proper management, will become blowing roots in one year.

The fourth sort will thrive extremely well if the seeds are sown in a warm border. When the plants come up they must be kept clean from weeds, and thinned where they grow too close.

The sixth sort is propagated either by off-sets from the roots or by seeds; the first is the most expeditious method, for the off sets will flower very strong the second year, whereas those which are raised from seeds seldom flower in less than five years. The roots of this should not be removed oftener than every third year. The best time for transplanting them is about the beginning of October, soon after the leaves decay; they should not be kept long out of the ground, and must have a light sandy soil, and a sheltered situation.

Plant the roots nine inches or a foot asunder, and five inches deep in the ground. If they are propagated by seeds, they should be sown in pots filled with light earth, soon after they are ripe, and the pots placed under a hot-bed frame in winter, till they have obtained strength, after which they will live through the winter in the full ground;

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ground; but in very severe seasons the surface of the ground should be covered with tanners bark, sea-coal ashes, straw, or pease-haulm to keep out the frost.

DAISY, *Bellis*, a genus of plants ranged by Linnæus among the *syngenesia polygamia superflua*, and of which there are only two species. 1. Daisy with a naked stalk, or the garden, or the common Daisy. 2. Daisy with leaves on the lower part of the stalk. From these two species many varieties have been raised, among which are, 1. The Childing or proliferous Daisy. 2. The red and white garden Daisy with double flowers. 3. The double variegated garden Daisy. 4. The cockcomb Daisy, with red and white flowers, &c.

Childing or Proliferous DAISY. This flower is, by the gardeners, called the hen and chickens. The root sends out many fibres; and the leaves, where they are most full, have the middle veins a little reddish; and are irregularly waved, or bluntly indented on the edges. The stalks are numerous, of a pale green, tinged with red at the bottom, sometimes naked, and sometimes decorated with a little filmy leaf. On the summit of each stalk stands one principal flower surrounded with five or six small ones. The central flower is so large, the stalk usually bends with it, its colour is red, more or less variegated with white, and the little flowers are paler.

Culture of the proliferous DAISY.

This, and all other sorts of Daisies propagated in our gardens, are increased by parting their roots. No compost is required for them, the common garden soil answering the purpose, much better than any mixture, but to preserve them in full beauty, this should be changed every year. About the middle of September, set some good roots, parted from a thriving stock, in an east or west border, at about eight inches distance, and, if the season be dry, give them a gentle watering, which is all the care they require. In spring they will flower.

The same attention must be paid to them every autumn, and they will from year to year improve, rather than decline.

Blue DAISY, *Globularia*, a genus of plants ranged by Linnæus among the *tetrandria monogynia*, and of which there are seven species. 1. Blue Daisy with a shrubby stalk and spear-shaped entire leaves, ending in three points. 2. Blue Daisy with a shrubby stalk, with the lower leaves, wedge-shaped, and blunt, and those growing on the stalk spear-shaped. 3. Blue Daisy with an herbaceous stalk, the lower leaves divided into three points, and those growing on the stalk spear-shaped, or the common blue Daisy. 4. Blue Daisy with the lower leaves crenated, and prickly, and those on the stalks entire, and ending in a point. 5. Blue Daisy with a naked stalk, wedge-shaped leaves, ending in three points, with the middle segment the least. 6. Blue Daisy with a naked stalk, and entire spear-shaped leaves. 7. Blue Daisy with a naked head, alternate sessile heads to the stalks, and oval, spear-shaped, entire leaves.

The first and second species are natives of France and Spain. The third grows naturally upon rocky sandy places in most parts of Europe. The fourth is a native of Grenada, the fifth of Pannonia, Austria, Switzerland, and the Pyrenean mountains. The sixth of the Pyrenean mountains and those of Austria; and the seventh grows naturally in the Levant.

Culture of the Blue DAISY.

The first and second species are propagated by cuttings which should be planted in pots filled with light earth, and then placed in a very moderate hot-bed, observing to water and shade them till they have got fresh root; after which they may be taken out of the bed and inured to the open air by degrees. They must always be sheltered from severe frosts.

The proper time for taking off the cuttings is in April, just before they begin to make new shoots. The third sort is propagated by parting the roots in September, which is also the proper season for transplanting them: they should have a loamy soil, and a shady situation, and should not be removed oftener than every other year.

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The fourth, fifth, and sixth species are hardy plants, and may be propagated in the manner directed for the third.

The seventh species is cultivated in the manner directed for the first and second sorts.

DALECHAMPIA, a genus of plants of which there is no English name and only one species.

This plant grows naturally in Jamaica. From the root composed of many fibres, rise several weak twining stalks, which fasten themselves to the neighbouring plants, and mount up a considerable height; they are garnished at each joint by one trifoliate leaf. The flowers are produced from the sides of the stalks, three or four growing upon each footstalk, these are of an herbaceous colour and very small; they have each a double involucre, made up of two orders of leaves, which are narrow, and armed with small bristly hairs, that sting the hands of all who unwarily touch them.

Culture of the DALECHAMPIA.

This plant is propagated by seeds, which must be sown early in the spring upon a hot-bed. When the plants are three inches high, they should be carefully transplanted, each into a separate small pot, and plunged into a hot-bed of tanner's bark, being careful to screen them from the sun till they have taken new root, after which the fresh air should be admitted to them freely, in warm weather. When the plants are grown big enough to fill these pots with their roots, they should be removed into larger, and placed in the bark-bed of the stove; where they must be supported with stakes, or a trellis, round which they will twine, and rise to the height of eight or ten feet.

These plants must be kept constantly in the stove, for they are too tender to bear the open air of our climate, even in the summer season; therefore they should be placed near the back of the stove, where, in summer, they will flower, and in very warm seasons perfect their seeds. These plants do not continue longer than one year, so that young plants should be raised annually to preserve the kind.

DAPHNE, *Spurge Laurel*, or *Mezerion*, a genus of plants ranged by Linnæus among the *diandria monogynia*, and of which there are ten species. 1. Daphne with three flowers together sitting close to the stalk, and spear-shaped, deciduous leaves, commonly called Mezerion. 2. Daphne with flowers sitting close to the sides of the branches, and oval nervous leaves, covered with silky hairs on both sides. 3. Daphne with flowers in clusters growing close to the sides of the branches, and spear-shaped blunt leaves, woolly on their under side. 4. Daphne with clusters of flowers growing close to the sides of the branches, and spear-shaped blunt leaves, woolly on their under side. 5. Daphne with bunches of flowers proceeding from the sides of the branches, and smooth, spear-shaped leaves, commonly called Laureola, or Spurge Laurel. 6. Daphne with bifloral flower stalks proceeding from the sides of the branches, and spear-shaped, oval leaves. 7. Daphne with flowers upon footstalks collected into the heads, and terminating the branches, and oblong, oval, smooth leaves, growing opposite one to another. 8. Daphne with clusters of sessile flowers terminating the branches, and spear-shaped naked leaves. 9. Daphne with a panicle of flowers terminating the branches, and narrow, spear-shaped pointed leaves. 10. Daphne with flowers upon footstalks terminating the branches, and narrow, spreading, sharp-pointed leaves, scattered thin upon the branches.

These are shrubby plants. The first species grows naturally in the northern parts of Europe, and particularly in some places in Hampshire in this country. It has been long cultivated in the nursery gardens as a flowering shrub. There are two varieties of this sort; one with a white flower which is succeeded by yellow berries, and the other with peach coloured flowers and red fruit. This shrub grows to the height of five or six feet, it flowers in February and March, and sometimes so early as January.

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The second, third, and fourth sorts are natives of the southern parts of Europe.

The fifth species grows naturally in England, and some other countries of Europe. It is an evergreen shrub, and is proper to fill up the vacant spaces in plantations.

The sixth species is a native of Pontus; the seventh of China; the eighth of Switzerland, and Hungary; the ninth of Spain, and Italy; and the tenth of Ethiopia.

Culture of the DAPHNE.

The first and eighth species are propagated by seeds which should be sown on a border exposed to the east, soon after the berries are ripe. When the plants come up they will require no other care than being kept clean from weeds: they may continue in the seed-bed for two summers, but must be thinned where they grow too close; then at Michaelmas, when the leaves are shedding, they must be carefully taken up, and planted in a nursery, in rows, about sixteen inches asunder, and eight or nine inches distance from each other in the rows. Here they may stand two years, by which time they will be fit for removing to the places where they are designed to remain. The best season for transplanting them is in Autumn, and they thrive best in light, sandy, dry earth.

The second, third, and fourth species are also raised from seeds, which should be sown in a dry soil, and a warm situation. After the plants come up they should be treated in the same manner as the former sorts.

The seeds of the sixth, seventh, and ninth species should be sown in pots, for they will not bear the open air of our climate in winter, but must have a good greenhouse to preserve them.

The tenth species will not thrive in this country without the help of the bark-stove, and it will not bear transplanting.

DATE-TREE, a species of the *Palma* or *Palm-tree*. These trees grow plentifully in Africa and some of the eastern countries, from whence the fruit is brought to England. They rise to a great height in the places where they are native. The leaves of these trees, when grown to a size for bearing fruit, are six or eight feet long; these have narrow long leaves set on alternately their whole length.

The small leaves or lobes are toward the base three feet long, and little more than one inch broad; they are closely folded together when they first appear, and are wrapped round with brown fibres or threads, which fall off as the leaves advance, making way for them to expand; these never open flat, but are hollow like the keel of a boat, with a sharp ridge on their back; they are very stiff, and, when young, of a bright green, ending with a sharp black spire. The flowers come out in very long bunches from the trunk between the leaves, and are covered with a spatha or sheath which opens and withers. They have no stamina but have a roundish germen which afterwards becomes an oval berry, with a thick pulp inclosing a hard oblong stone, with a deep furrow running longitudinally. The bunches of fruit are sometimes very large.

Culture of the DATE-TREE.

These plants may easily be produced from the seeds taken out of the fruit, provided they are fresh, which should be sown in pots filled with light rich earth, and plunged into a moderate hot-bed of tanners bark, which should be kept in a moderate temperature of heat, and the earth frequently refreshed with water. When the plants are come up, they should be transplanted each into a separate small pot filled with the same light earth, and plunged into a hot-bed again, where they must be watered, and have fresh air admitted to them in proportion to the warmth of the season, and the bed in which they are placed. During the summer time they should remain in the same hot-bed, but in the beginning of August they should by degrees be inured to more air, to harden them against the approach of winter; for if they are too much forced, they will be so tender as not to be preserved through that season without much

difficulty, especially if there is not the convenience of a bark stove to keep them in.

The beginning of October remove the plants into the stove, placing them where they may have a moderate share of heat. They might be preserved alive in a cooler situation, but their progress would be so much retarded, as not to recover their vigour the succeeding summer.

Whenever these plants are removed, which should be done once a year, great care should be taken not to cut or injure their large roots, which is very hurtful to them. All the small fibres which are inclinable to mouldiness, must be taken off, or they will in time decay, and hinder the fresh fibres from coming out, which will greatly retard the growth of the plants.

The compost proper for these plants, must be made in the following manner; half of light fresh earth from a pasture ground, the other half sea sand, and rotten dung, or tanners bark, in equal proportion; these must be carefully mixed, and laid in a heap three months at least before it is used, often turning it over to prevent the growth of weeds and to sweeten the earth.

Always observe to allow them pots proportionable to the sizes of the plants, but you must never let them be too large, which would be of worse consequence than their being too small. During the summer they should be frequently refreshed with water, but care must be taken not to give it in too large quantities, and in winter they will require very little.

These plants are very slow growers, even in their native countries, so that it cannot be expected they should advance very fast here; but they may be greatly forwarded, by placing the pots in a hot-bed of tanners bark, which should be renewed as often as necessary, and the plants continued therein both winter and summer.

D'AYENA, a genus of plants which receives its name from Le Duc D'Ayen, a lover and promoter of the science of botany, and of which there is but one species.

This plant grows naturally in Peru, it has a weak ligneous stalk a foot high, which divides into several horizontal branches, decorated with oblong heart-shaped leaves, which are slightly indented on their edges, standing upon pretty long footstalks; they are of a lucid green, and end in acute points.

At the base of each footstalk, from the side of the branches, the flowers appear, two, three, or four arising from the same point, each standing upon a separate slender footstalk; they are tubulous, and spread open at the top, their colour is a fine purple; and there is a continual succession of flowers upon the same plants from July to winter.

Culture of the D'AYENA.

This plant is propagated by seeds, which should be sown upon a moderate hot-bed early in the spring; and when the plants have four leaves, part of them may be transplanted on a fresh hot-bed, and part into small pots, and plunged into a hot-bed of tanners bark, shading them till they have taken new root; after which the fresh air should be admitted to them in proportion to the warmth of the season. These plants should continue in the hot-bed all the summer, where they must have a great share of air, for those which are exposed to the open air will not thrive, and if they are too much drawn, they will not flower well, nor will they perfect their seeds, unless they are brought forward in the spring, and sheltered in the summer.

DECEMBER, the twelfth and last month in the year.

All that demands the attention of the gardener at this time, is the care of his flower beds, and they must be covered up or opened, as the season changing from cold to heat may direct. Look carefully over the stove and greenhouse plants. The closeness of the greenhouse, especially if there has been too free watering, will occasion mouldiness on some of the more tender plants, to prevent which, let care be taken not to moisten the close

air by too free a watering of the plants, and let the mouldiness be carefully rubbed off wherever it appears; and as this will not prevent it sometimes rising again, it should be then wiped off with a flannel wetted in a slight brine. When the leaves are faded past recovery, they must be immediately pulled off, and great care taken that they are cleared out of the green-house directly, for dead leaves are very prejudicial to all the plants. Let the same practice be observed in the stove, the windows of which should be laid open in the middle of a mild day. Here let the heat be carefully kept up to a due height, without exceeding those bounds: and let the plants be watered in proportion, the more for the increased heat, but always by little at a time.

In the seminary let the earth be turned which was laid up in ridges, and a little soil scattered over it with an even hand. Look to the seed-beds of those kinds most in danger from vermin, and bait the traps with due care. Draw up the earth in mild days about new planted shrubs, and see the stakes of the rest keep secure, that the winds cannot rock them.

In the fruit-garden take care that the new planted trees are defended from severe frosts, by keeping the ground well covered, and from winds, by seeing that their supports are secure.

In the kitchen garden see the Artichoke plants well earthed up, and continue the care of the Cauliflower-plants, which are under glasses, by giving them air in the most favourable hours, to prevent their decay, and give air also to the young sallading. If the weather is tolerably mild, you may plant the several kinds of Cabbages for seed.

DEVIL IN A BUSH, or FENNEL-FLOWER, *Nigella*, a genus of plants, ranged by Linnæus among the *polyandria pentagynia*, and of which there are five species. 1. Devil in a Bush, with flowers, encompassed with a leafy involucre. 2. Devil in a Bush, with petals nearly three-pointed, and leaves somewhat hairy. 3. Devil in a Bush, with five pointals, entire petals, and turbinated seed-vessels. 4. Devil in a Bush, with ten pointals, equalling the Corolla. 5. Devil in a Bush, with ten pointals longer than the Corolla.

These are all annual plants; the first species grows wild among the corn, in the southern parts of Europe; the second is a native of Egypt and Crete; the third grows naturally among the corn in France and Italy, and Germany; the fourth in the south parts of France and Spain; and the fifth about Aleppo. They abound in varieties with double flowers, white, blue, yellow, &c. Those with single flowers are never admitted into gardens.

Culture of the DEVIL IN A BUSH.

All these plants are propagated by seeds, which should be sown in patches upon a bed of light earth, where they are to remain: for they seldom succeed well if transplanted.

When the plants come up, they must be thinned where they grow too close, leaving but three or four of them in each patch, observing to keep them clear from weeds, which is all the culture they require. In July they will produce their flowers, and their seeds will ripen in August, when they should be gathered and dried: then rub out each sort separately, and preserve them in a dry place.

The season for sowing these seeds is in March; but if some of them is sown in August, soon after they are ripe, upon a dry soil and in a warm situation, they will abide through the winter, and flower strong the succeeding year; and by sowing the seeds at different times, they may be continued in beauty most part of the summer.

DEVIL'S BIT, a species of the Scabious. See the article SCABIOUS.

DIAMOND FICOIDES, DIAMOND PLANT, or ICE PLANT. See the article ICE PLANT.

DILL, *Anethum*, a genus of plants, ranged by Linnæus among the *pentandria digynia*, and of which he distinguishes two species: Dill, strictly so called, and

Fennel. Two distinct genera according to other authors.

Dill is an annual plant, and a native of Spain and Portugal.

Culture of DILL.

This plant is propagated by sowing the seed in autumn, soon after they are ripe; for if they are kept out of the ground till spring, they frequently miscarry; or if any of the plants do come up, they often decay before they have perfected their seeds. They love a light soil, and must be sown where they are to remain, for they will not bear transplanting; therefore, the best way is, when the plants are come up, to hoe them out, leaving the plants about eight or ten inches asunder, every way, observing to keep them clear from weeds. When the seeds are ripe, the heads or umbels should be cut, and spread upon a cloth to dry, and then beat out for use.

DIOSCOREA, a genus of plants, for which there is no English name. There are five species. 1. Climbing Dioscorea, with black briony leaves, and fruit growing in long bunches. 2. Climbing Dioscorea, with a spear-pointed leaf, and fruit growing in long bunches. 3. Climbing Dioscorea, with a roundish pointed leaf, and fruit growing in long bunches. 4. Dioscorea, with heart-shaped leaves, and a winged stalk, bearing bulbs, commonly called Yam. 5. Dioscorea, with heart-shaped leaves, growing alternate and opposite, and a smooth stalk.

The first sort grows naturally in most of the islands of the West-Indies; it has slender climbing stalks, which fix themselves to any support near them, and rise to the height of eighteen or twenty feet, decorated with heart-shaped leaves, ending in acute points; they stand upon pretty long foot-stalks, from the base of which arise a branching spike of flowers, which are small, and of no beauty.

The second sort differs from the first in the shape of its leaves: these having two round ears at their base, but the middle extends to an acute point; the bunches of flowers are longer, and looser placed than those of the former sort.

The third sort has broad, round, heart-shaped leaves, ending in acute points; and the flowers come out on long, loose strings, standing on short foot-stalks.

The fourth sort has triangular winged stalks, which trail upon the ground, and extend to a great length; these frequently put out roots from their joints, as they lie upon the ground, whereby the plants are multiplied.

The fifth sort grows naturally in Virginia, and other parts of North America; this has a smooth stalk, which climbs on the neighbouring plants, and rises five or six feet high, decorated with heart-shaped leaves. The flowers come out from the sides of the stalks, in the same manner as the other sorts, but have no beauty.

Culture of the DIOSCOREA.

The first, second, third, and fifth species, are propagated by laying their branches into the ground, which in three months will put out roots; they should then be taken from the old plants, and set into separate pots, which must be plunged into the tan-bed in the stove; during winter they should have but little water: but in summer, when the plants grow vigorously, they require more; and in warm weather a large share of air should be admitted to them.

When the seeds of these plants are brought to England, they should be immediately sown in pots, and plunged in a hot-bed, where, if the seeds are fresh, the plants will come up in two months; but sometimes they remain in the ground till the following spring, before the plants appear; when this happens, the pots should be screened from the frost in the winter, and put into a new hot-bed in the spring, which will bring up the plants.

The fourth species is propagated by cutting the root into pieces, observing to preserve an eye or bud to each, as is practised in planting of Potatoes; each of these being planted will produce three or four large roots. In America they are commonly six or eight months in the ground, before the roots are taken up for use: which when

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when roasted or boiled, are eaten by the inhabitants, and sometimes they make them into bread.

DIOSMA, *African Spirea*, a genus of plants of which there are four species. 1. African *Spiræa*, with leaves placed in the form of a cross. 2. *Diosma* with narrow hairy leaves. 3. *Diosma* with smooth, narrow, acute leaves, which are spotted on their under side. 4. African *Spiræa*, with leaves like the berry-bearing heath.

The first sort rises to the height of three or four feet; the branches are slender, and rise from the stem very irregularly; the leaves are placed cross-ways; and the flowers are produced at the end of the branches, between the leaves: these plants continue a long time in flower, and make a fine appearance when they are intermixed with other exotics in the open air.

The second sort is a very elegant shrub, growing to the height of five or six feet; the stalks are of a fine coral colour; the leaves come out alternately on every side of the branches; they are narrow, pointed, and hairy: the flowers, which are small and white, are produced in clusters at the end of the shoots. These, and the whole plant, have a most agreeable scent.

The third sort rises from two to three feet high, forming a bushy head, the leaves are smooth, narrow, and acute pointed, having two or three spots on their under side, the flowers are small, of a blueish colour, and come out at the end of the shoots.

The fourth sort is of humbler growth than any of the former, seldom rising above two feet high, and spreads out into many branches, the leaves are smooth, and resemble those of the Heath. The flowers are produced in clusters at the end of the branches, like those of the second sort, but are smaller, and the bunches not so large.

Culture of the DIOSMA.

All these plants are propagated by cuttings, which may be planted in pots during any of the summer months, and plunged in to a moderate hot-bed, where, in the middle of the day, they should be shaded from the sun, and frequently refreshed with water. In about two months the cuttings will have taken root; they must then be transplanted each into a separate small pot, and placed in a shady situation till they have taken root, when they may be placed among other tender exotics. Here they may remain till the beginning of October or later if the season continues favourable, for they only require to be sheltered from frost, so that they may be preserved very well through winter in a dry airy greenhouse, and in summer they may be exposed to the open air, with other green-house plants.

DIRCA, a genus of plants of which there is but one species.

This shrub grows naturally in moist places, it rises to the height of four and sometimes five feet; the flowers come out early in the spring before the leaves; they are small, tubulous, and of an herbaceous colour so make very little appearance. The leaves are oval, smooth, and of a pale green.

Culture of the DIRCA.

This plant is propagated by layers, which are commonly two years before they put out roots. They should have a moist soil and a shady situation.

DISK or **DISC**, an aggregate of florets forming as it were a plain surface.

DITTANDER or **PEPPERWOLT**, *Lepidium*, a genus of plants of which there are many species. Scarce any of them are cultivated in gardens, except for the sake of variety. If they are permitted to scatter their seeds in autumn they will come up early in the spring, when they should be kept clear from weeds which is all the culture they require.

DITTANY, a species of *Origanum*. See the article **ORIGANY**.

DOGSBANE, *Apocynum*, a genus of plants ranged by Linnæus among the *pentandria monogynia*, and of which there are five species. 1. Dogsbane with an erect herbaceous stalk, oval leaves, smooth on

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both sides, and terminated by a head of flowers. 2. Dogsbane with an erect herbaceous stalk, oblong leaves, and heads of flowers on the sides of the branches. 3. Dogsbane with an erect herbaceous stalk, and oval, spear-shaped leaves. 4. Dogsbane with an upright shrubby stalk, oval spear-shaped leaves, and acute flowers. 5. Dogsbane with a perennial twining stalk, and oval veined leaves.

The first and second species of this plant are natives of Canada and Virginia, and have perennial roots.

The third species grows naturally in the islands of the Adriatic sea.

The fourth is a shrubby plant, and a native of Ceylon, and the fifth grows naturally in India.

Culture of the DOGSBANE.

The first and second species are propagated by parting of the roots, for they seldom ripen their seeds in England. They are however hardy plants, and should have a light dry soil, and their roots must be parted in March, before they begin to put out new stalks.

The third species is also propagated by parting the roots. It never produces any seeds, even at Venice where it grows without culture. The stalks decay in autumn, and new ones are put out from the roots in the spring, which is the best season for removing and parting the roots.

The fourth species is very tender, and must be constantly kept in a hot-house, and plunged in the tan-bed, otherwise it will not thrive in England. It may be propagated by cuttings during the summer months, the cuttings must be laid in the stove three or four days to dry before they are planted. They should be sparingly watered, especially in winter, and should be planted in light sandy earth.

The fifth species is propagated in the same manner as the fourth, only that it requires to be kept constantly in the stove, otherwise it will not live in this country.

DOGSBANE, *Tutsan leaved Apocynum*. This is a very singular and beautiful plant, easily raised in our gardens, and worthy to be made universal in them; not only for the flower, but for the leaves and general manner of growth.

It rises a yard high; is of regular growth, and very handsome aspect. The root is very long, irregularly divided, brownish, and hung at distances with tufts of slender white fibres. The stalks rise single from each head of the root, and they are upright, firm, smooth, red toward the base, and of a green and brown variously mixed upwards. The branches are not numerous, but they grow with great regularity from the bosoms of the upper leaves. These, as also the tender part towards the top of the principal stalk are usually spotted and stained with irregular dots of brown. The leaves are placed in pairs at distant joints, and they are supported by short reddish footstalks. They are broad, short, of a figure nearly oval, and of a firm substance. Their colour is a deep green, and they have conspicuous veins, of which the middle one is usually stained with purple, and the others are white. The footstalks of these leaves are a little hollowed; and the under part of the whole leaf is of a much paler green than the upper, and downy.

The flowers are small, but they are singular in form and colouring, and their number makes some amends for their want of size. They crown the top of the main stalk, and the extremities of all the branches, in a kind of circular tufts, not close ranged and compact, but regular enough, and of no short continuance. The ground colour of the flower is white, but it is stained in various proportions with a lively crimson, sometimes this colour is disposed in streaks and rays.

Culture of the Tutsan leaved APOCYNUM.

It is a native of North-America, where it thrives best in a deep, rich, and light mould, in thickets, at the sides of forests, or near lofty trees. It does not bear absolute shade, nor will grow freely where there is an open sun.

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We learn by this to compose an artificial soil for it, and adopt a proper situation.

Let the gardener mix one bushel of meadow-earth, rich and black; two bushels of pond-mud, three pecks of wood-pile earth, and one of hog's-dung; they should be thrown up in a heap, and turned at times.

When this is ready, and seeds are procured from America, let a pot be filled with it, and some of them scattered over the surface; cover them a quarter of an inch with the same compost; this being done early in March, let the shooting of the seeds be promoted, by setting the pot up to the rim in a bark-bed. The plants, when they have a little height, should be removed into separate small pots, and shaded in the hot-bed till they have taken root. After this they must be hardened to the air.

In May let a border be chosen that is well-sheltered, warm, and somewhat shaded, at least, that has not any time the full blaze of a noon-day sun. Let the earth be dug out of this for a space sufficient for the number of plants intended to be preserved, and throw in the compost ten inches deep. Take the plants carefully out of the pots, with the whole ball of earth, and trim the outside fibres. Open holes at a foot and a half distance, and set in the whole ball of earth, with its plant perfectly upright. Draw some mould over the surface of the ball of earth from the pot, and settle it well about the stem, and then give every evening a gentle watering, and the plantation will succeed. Their own earth will afford nourishment enough to the roots for the first days: and after this the fibres on the surface will shoot; the ball will crack and break with the frequent waterings, and new shoots will be formed every way. Some of the plants will flower the first season, and all the succeeding summer.

DOG'S-TOOTH, or DOG'S-VIOLET, *Erythronium*, a genus of plants, ranged by Linnæus among the *hexandria monogynia*, and of which there are two species. 1. Dog's-tooth, with a broad and round leaf, and a purple red flower. 2. Dog's-tooth, with a longer and narrower leaf, and a purplish flower.

The first sort sends out two oval leaves, which are joined at their base, three inches long, and one and a half broad in the middle; these at first embrace each other, inclosing the flower, but afterward they spread flat upon the ground: they have purple and white spots all over their surface; between these rises a single naked stalk, about four inches high, of a purple colour; this sustains one flower, composed of six petals, which in some are purple, and in others white; the flower hangs downward, and the petals reflex and spread open to their base. The root of this plant is white, oblong, fleshy, and shaped like a tooth, from whence it had the title of Dog's-tooth.

The second sort differs from the first in the shape of its leaves, which are longer and narrower, and the flowers are a little larger, but not so well coloured. They grow naturally in Hungary, and some parts of Italy.

Culture of the Dog's-TOOTH.

Both these species are propagated by off-sets from their roots; they may be transplanted any time after the beginning of June, when their leaves will be quite decayed, till the middle of September; but the roots should not be kept long out of the ground: for if they shrink, it will often cause them to rot; the roots of these flowers should not be planted scattering in the borders of the flower-garden, but in patches near each other, where they will make a good appearance. They delight in a gentle loamy soil, and a shady situation.

DOVE'S-FOOT. See GERANIUM.

DRAGON, *Dracontium*, a species of Arum. This plant grows naturally in most of the islands in the West-Indies; it has trailing stalks, which put out roots at every joint that fasten to the trunks of trees, walls, or any support which is near them, and thereby rise to the height of twenty-five, or thirty feet. The leaves are placed alternately upon long foot-stalks; they are four or five inches long, and two and a half broad, and have several oblong holes in each, which on the first view appear as if eaten by insects, but are natural to the

leaves. The flowers are produced at the top of the stalk, which always swell to a much larger size in that part, immediately under the flower, than in any other; their colour is a pale yellow, inclining to white.

There are other sorts of this species, but they are never cultivated in gardens.

Culture of the DRAGON.

It is easily propagated by cuttings, which if planted in pots filled with poor sandy earth, and plunged into a hot-bed, will soon put out roots. The plants are too tender to live in the open air of our climate; therefore the pots should be placed near the walls in the hot-house, against which the plants will climb; they should have but little water given them in winter, but in warm weather they require it frequently, at which time the fresh air should always be admitted to them. The plants have no particular season for flowering; sometimes they flower in autumn, and sometimes in the spring, but they do not ripen their seeds in England.

DRAGON'S-HEAD, *Dracocephalum*, a genus of plants, ranged by Linnæus among the *didynamia gymnospermia*, and of which there are eleven species. 1. Dragon's-head, with spiked flowers, and spear-shaped sawed leaves. 2. Dragon's-head, with spiked flowers, and compound leaves, commonly called Balm of Gilead. 3. Dragon's-head, with spiked flowers, and heart-shaped, winged, sinuated leaves. 4. Dragon's head, with spiked flowers, and the leaves and bractæ narrow, divided and prickly. 5. Dragon's-head, with spiked flowers, and the leaves and bractæ spear-shaped and undivided. 6. Dragon's-head, with flowers growing in whorls, oval, cut and crenated leaves, and spear-shaped intire bractæ. 7. Dragon's-head, with flowers growing in whorls, spear-shaped bractæ, and capillary ferratures. 8. Dragon's-head, with flowers growing in whorls, oblong bractæ, prickly ferratures, and woolly leaves. 9. Dragon's-head, with flowers growing in whorls, and orbicular, sawed, hairy bractæ. 10. Dragon's-head, with flowers growing in whorls, oblong, oval, and entire bractæ, and large nodding petals. 11. Dragon's-head, with flowers growing in whorls, oblong entire bractæ, and petals scarce larger than the cup.

The first, second, fourth and fifth species of this genus are perennial; the third is a biennial, and the rest are annual plants.

The second sort is a native of the Canary Islands; it is usually called by the gardeners Balm of Gilead, from the strong resinous scent which the leaves emit on being rubbed. This plant rises with several square stalks to the height of three feet, or more, decorated with compound leaves at each joint, which are placed opposite. The flowers terminate the stalks in short thick spikes, and are of a pale blue colour.

The fourth species grows naturally in Austria, and the fifth in Siberia and Sweden. The sixth, tenth, and eleventh, are natives of Siberia; the seventh of Moldavia, and the eighth and ninth are natives of the east.

The first, fourth, and fifth species are propagated by parting of the roots in autumn; they will live in the air: but a moist soil is best for these plants: and care should be taken to water them frequently in dry weather.

The second and third species are propagated by seeds, which if sown in autumn will more certainly grow than those which are sown in the spring: but if these seeds are sown in pots, they must be sheltered under a frame in winter; and if the plants do not come up the same autumn, they will in the spring. If the seeds are sown in the full ground, it should be in a warm border, and in frost they should be sheltered.

These plants may also be propagated by cuttings, which if planted in a shady border, any time in summer, will soon take root, and furnish plenty of rooted plants; it continues producing flowers most part of the summer, and is usually kept in green-houses; but in mild winters the plants will live abroad.

The sixth, eighth, ninth, tenth, and eleventh species, are all propagated by seeds, sown either in the spring or autumn, in the places where they are to remain, and will

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will require no other culture than to be thinned and kept clean from weeds.

Bastard-Dragon, a species of the *Hæmanthus*; this plant has roots composed of many thick fleshy tubercles, which join at the top, where they form a head, out of which arises a fleshy spotted stalk, like that of the Dragon, which spreads out at the top into several spear-shaped leaves, waved on their edges. The stalks grow about a foot high; the leaves are six or eight inches long, and two broad in the middle; from the side of the stalk near the ground; breaks out a strong fleshy foot-stalk, about six or eight inches long, sustaining at the top a large cluster of flowers, of a yellowish red colour; these appear in May, June, or July, and are succeeded by berries, which are of a beautiful red colour when ripe.

Culture of the BASTARD-DRAGON.

This plant may be propagated by parting of the roots in the spring, before the plants put out new stalks: this is also the right time to shift and new pot them; but as the roots do not multiply very fast in off-sets, the best way is to propagate them from seeds, which they ripen plentifully in England; these should be sown soon after they are ripe, in pots filled with light earth, and kept in the stove during the winter.

If these pots are plunged into the tan-bed in the bark-stove, in the vacancies between the plants, the earth will be kept warm, and will not dry so fast as in a dry stove, by which method the seeds will be sooner prepared to vegetate. In the spring the pots may be taken out of the stove, and plunged into a hot-bed, which will bring up the plants: these must have air admitted to them every day in warm weather; and when they are fit to be removed, they must be planted into separate small pots, filled with light earth, and plunged into the hot-bed again, to promote their taking new root: then they must be carefully hardened, and afterwards removed into the dry-stove, where they should constantly remain.

DRAGON-TREE, a species of the *Palma*, or Palm-tree.

This tree grows naturally in the Cape de Verd islands; it is called Dragon-tree, because the inspissated juice of the plants becomes a red powder, very like the eastern dragon's-blood, and is frequently used instead of it in the shops; but the tree from whence the true dragon's-blood is taken, is of a very different genus from this.

The trunk of this tree rises twelve or fourteen feet high; there are the circular marks or rings left the whole length where the leaves are fallen off; for as these half embrace the stalk with their base, so when they fall away, the vestigia where they grew remain. The top of the stalk sustains a large head of leaves, which come out singly all round it; these are often four or five feet long, and an inch and a half broad at their base, where they embrace the stalk, and lessen gradually to the end, where they terminate in a point; these leaves are pliable, and hang down all round the stem; they are entire, of a deep green, and smooth on both surfaces.

Culture of the DRAGON-TREE.

This tree is propagated by seeds in the same manner as the Date-tree. See the article **DATE-TREE**.

The plants will bear to be exposed to the open air, in a warm sheltered situation, during the three warmest months: but they should be removed into the dry-stove before the morning frosts come on in autumn, and here they may remain all the winter; they should have but little water during this season, and in summer, unless it is remarkably dry they should be very seldom watered: for too much moisture will destroy them.

DROPWORT, *Filipendula*, a species of the *Spiræa*. See the article **SPIRÆA**.

African DROSER, a genus of plants, ranged by Linnæus among the *pentandria pentagynia*.

This curious little plant, though a native of the warmest parts of Africa, is capable of bearing our climate in a full exposure, unhurt. The root is fibrous and reddish. The leaves are numerous, and very elegant; they rise from the root by a narrow base, and at the height of an inch begin to swell out into breadth; they

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are largest in the middle, and terminate in a sharp fine point.

The universal tinct is red; a mixture of a brownish cast obscures the full glare of the colour: but there is with this somewhat of crimson and of purple; they are covered with long and stiff hairs, of a tawny redish: and they are most frequent at the edges. Upon the surface of these leaves stand large round drops of a transparent fluid, reflecting the colour of the hairs, and glittering like gems. The stalk which supports the flowers, rises with these, and exceeds them considerably in height. The length of the leaves, when in full perfection, is about five inches; and their breadth half an inch; but this stalk will grow to a foot in height, and rises tolerably erect and firm; its colour is a purplish brown, and it has neither leaves on it nor branches. The flowers grow in a short spike at the top, never exceeding eight or ten in number, and they are small; they do not open freely: but when they approach to it, their milk-white colour affords a fine contrast, with the red of the whole plant.

Culture of the DROSER.

This plant is propagated by seeds, which should be procured from Africa. Early in the spring sow them in a damp soil and sheltered situation, just opening the surface of the ground to receive them. When the plants come up, they will require no other culture than being kept clean from weeds. If they do not flower, they will at least shew their leaves, and these have sufficient beauty to attract the eye of every curious beholder.

DRUPE, a sort of pericarpium, consisting of a soft, fleshy, and succulent pulp, in the centre of which there is a nucleus.

DUCK'S-FOOT, or **MAY-APPLE**, *Podophyllum*, a genus of plants, ranged by Linnæus among the *polyandria monogynia*; and of which there are two species. 1. Duck's-foot, with target-shaped leaves; having lobes. 2. Duck's-foot, with half heart-shaped leaves, two growing at a joint.

Both these species are natives of North America; they rise in the spring about six inches high; their leaves are smooth, and of a light green, and they bear a white flower.

Culture of the Duck's-FOOT.

These plants propagate so fast by their creeping roots, that few persons are at the trouble of sowing the seeds; every part of the root will grow, so they may be annually parted, either in autumn, when their leaves decay, or in spring just before the roots begin to shoot; they require no other culture than being kept clean from weeds.

They love a light loamy soil, and a shady situation, and are so hardy, as seldom to be injured by frost.

DUNG, in agriculture, &c. All kinds of Dung contain some matter, which when mixed with the soil, ferments therein, and by that fermentation dissolves the texture of the earth, and divides and crumbles its particles very much. This is the real use of Dung in agriculture: for as to the pure earthy part of it, the quantity is so very small, that after a perfect putrefaction, it bears an extremely inconsiderable proportion to that of the earth it is intended to manure.

The fermenting quality of Dung is principally owing to the salts it contains: and yet those or any other salts applied immediately to the roots of the plants, always destroy them; this proves that the business of Dung is not to nourish, but to divide and separate that terrestrial matter, which is to afford the nourishment to vegetables, through the mouths of their roots. And the acrimony of the salts of dung is so great, that the nicest managers we have (the florists) have wholly banished the use of it from their gardens. If the use of it was also abolished in kitchen-gardens, it would be much better: for it is possible to succeed full as well without it; and it gives an ill taste to all the excellent roots and plants that are to stand in the earth, in which it is an ingredient. The water of a Cabbage raised in a garden, manured with dung, if boiled, is of an intolerable stink; but this is not so much owing to the nature of the plant, as of the manure used to it; for a field Cabbage being boiled, the

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water has scarce any smell, and what it has, is not disagreeable. It is also a well known fact in the country, that a Carrot raised in a garden has none of that sweet flavour that such as grow in the fields have; but in the place of this fine natural relish, it has a compound taste, in which the matter of the manure has no small share; and this difference extends to the taste of all roots nourished with such different diet.

Dung not only spoils the flavour of the esculent vegetables, but the drinkables also, into the original composition of which it enters; they are obliged to use Dung in the poor vineyards of Languedoc: and the consequence is, that the wine is nauseous. The poor, who only raise a few Vines for the wine they drink themselves, and cannot be at the expence of this manure, have less of it, but then it is far preferable in flavour to the other; and it is a general observation, that the poor people's wine in Languedoc is the best, because they carry no Dung into their vineyards.

Another disadvantage attending the use of Dung, is, that it gives rise to worms; it is for this reason, that garden Carrots are generally worm-eaten, and field Carrots sound: and the same observation will hold good in other vegetables, in the field, and in the garden. Vegetable and animal Dung are in fact only the putrefaction of earth, after it has been altered by passing through animal or vegetable vessels. Vegetable Dung, unless the vegetable be buried alive in the soil, makes a much less ferment in it, than animal Dung does; but the Dung or putrid matter of vegetables, is much more eligible and wholesome for the esculent roots and plants, than that of animals.

Venomous animals are found to be very fond of Dung, and the scent often brings them into those gardens where it is used as manure; the snakes usually frequent dung-hills, and lay their eggs in them; and gardens, where dung is much used, are always frequented by toads: whereas the fields where roots are planted, are much less infested by them. There are some sorts of Dung hot and light, as sheep, horses, pigeons, &c. others fat and cooling, as that of oxen, hogs, &c.

There are two remarkable qualities in dung: the one is to produce a sensible heat, capable of bringing about great effects: the other is to fatten the soil and render it more fertile; the first of these is seldom found in any other Dung but that of horses and mules, while newly made, and a little moist; the great effects of this are seen in the kitchen-garden, where it invigorates and gives a new life to every thing, supplying the place of the sun; and to this we owe in a manner all the early vegetables of the spring.

The Dungs of pigeons, hens, and geese, are recommended by some authors, as better than any other for Asparagus, Strawberries, and for the propagation and culture of the tenderer garden-flowers; the Dung of pigeons is also particularly recommended by some for those trees, whose leaves are apt to turn yellow, if they grow in cold soils: but for this use it should first lie three years in a dung-hill, and then be applied sparingly in autumn, laying about an inch thickness of it at the root of the tree, and suffering it to remain there till the March following.

The Dung of poultry being hot and full of salts, tends much to facilitate vegetation, and is abundantly quicker in its operation, than the Dung of animals.

DURANTIA, a genus of plants, for which there is no English name, and only two species. 1. Prickly *Durantia*. 2. *Durantia* without thorns.

The first species has many trailing branches, which are armed with hooked thorns at every joint, and decorated with oblong leaves, which are placed without order. The flowers come out from the sides of the stalks in pretty long bunches, and are of a pale blueish colour.

The second sort has a branching woolly stalk, which rises seven or eight feet high; the branches are decorated with oval spear-shaped leaves, sawed on their edges, of a lucid green colour, and stand opposite. The flowers,

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which are blue, are produced in long bunches at the end of the branches.

Culture of the DURANTIA.

These plants being natives of warm countries, require a stove to preserve them in winter; they are propagated by seeds, which should be sown in small pots, and plunged into a hot-bed of tanners-bark. When the plants are fit to remove, they must be planted each into a separate small pot, and plunged into a hot-bed again, observing to shade them till they have taken new root, then they must be treated in the same manner as other plants from warm countries.

They may also be propagated by cuttings, which may be planted in any of the summer months, and plunged into a moderate hot-bed, observing to shade them from the sun till they have taken root; after which they may be treated in the same manner as the seedling plants.

DWARF-TREES were formerly held in great estimation in gardens; but since the introduction of *Espaliers*, which have justly gained the preference, the Dwarf trees are much neglected.

The manner of propagating Dwarf-pears, which have been found to succeed the best of any Dwarfs, is by grafting them on a quince stock, about six inches above the ground; and when the bud is shot so far as to have four eyes, it must be stopped, to give rise to lateral branches: for which purpose the uppermost eye should always be left outwards.

Apple, Pear, Plum, and Cherry-trees, are thus formed into Dwarfs, but the summer and autumn pears are found to succeed best. The manner of planting Dwarf-trees, should be at twenty-five feet distance, and the ground between sown or planted for kitchen use, while the trees are young, only keeping at some distance from their roots; stakes also should be fixed all round them, to which the branches may be nailed with liff, and thereby trimmed in an horizontal direction, and by that means prevented from crossing one another.

DYER'S BROOM, a species of the Broom. See **BROOM**.

DYER'S WEED, a species of the Bastard-Rocket. See the article **BASTARD-ROCKET**.

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Hare's-EAR: See **HARE'S-EAR**.

EARTH, if good, should be of a blackish colour, gravelly, fat, pliant, or easy to be digged; it should be neither cold nor light: it ought to have no ill smell or taste, and it should be of the same quality; three or four feet deep for trees, which if they have not that depth, will languish and decay after they have been planted six years. Fruit-trees will thrive in a less depth, and they generally produce the most generous fruits when their roots spread near the surface of the earth.

Husbandmen call that new Earth, which lying three or more feet deep, never served to the nourishment of any plant; or Earth that has been a long time built upon, though it had formerly bore; Earth likewise of a sandy, loamy nature, where cattle have been a long time fed, may be accounted such, and is of excellent use for most sorts of plants, especially if it has been thrown up in heaps to grow richer.

EBONY, *Ebenus*, a genus of plants, of which there is but one species.

It grows naturally in Crete, and in some of the islands of the Archipelago, rising with a shrubby stalk three or four feet high, which put out several side branches, decorated with hoary leaves at each joint; the branches are terminated by thick spikes of large purple flowers.

Culture of the EBONY.

This is propagated by seeds, which should be sown in the autumn: for those which are sown in the spring often

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often fail; sow them in pots, which in the winter must be placed under a frame, in spring the plants will come up. When they have acquired strength enough to be removed, they should be each planted into a separate small pot, and shaded till they have taken new root: then place them in a sheltered situation, where they may remain till autumn, when they must be removed into shelter; for these plants will not live in the open air through winter, nor should they be too tenderly treated; they succeed best when placed in an airy glass-case, where they will have more sun and air than in a greenhouse.

During the winter season, the plants must be sparingly watered, but in summer they should be often refreshed.

EBULUS, a species of the Elder-tree. See the article **ELDER-TREE**.

ECHINATED-SEEDS, &c. are such seeds, &c. of plants as are prickly and rough.

ECHINUS, a Bur, or the prickly bud or cover of the seed, or top of any plant.

EDGINGS, in gardening, the series of small but durable plants, set round the edges or borders of flower-beds, &c. The best and most durable of all plants for this use, is Box, which if well planted, and rightly managed, will continue in strength and beauty for many years. The seasons for planting this are the autumn, and very early in the spring; and the best species for this purpose is the Dwarf Dutch Box.

The Edgings of Box are now only planted on the sides of borders next walls, and not, as was some time since the fashion, all round borders of fruit-beds, in the middle of gardens, unless they have a gravel walk between them, in which case it serves to keep the earth of the borders from washing down on the walks in hard rains, and fouling the gravel. In the last age it was also a very common practice to plant borders, or Edgings of aromatic herbs, as Thyme, Savory, Hyssop, Lavender, &c. but these are all apt to grow woody, and to be in part, or wholly destroyed in hard winters. Daisies, Thrift, or Sea July-Flower, and Chamomile, are also used by some for this purpose, but they require yearly transplanting, and a great deal of care, else they grow out of form; and these are also subject to perish in very hard seasons.

EGG-PLANT, or **MAD-APPLE**, *Melongena*, a species of the Solanum, or Night-shade, and of which there are four different sorts. 1. Egg-plant, with an oblong violet-coloured fruit. 2. Egg-plant, with a taper violet-coloured fruit. 3. Egg-plant, with an incurved fruit. 4. Egg-plant, with prickly leaves and fruit.

The first sort grows naturally in Asia, Africa, and America, where the fruit is commonly eaten by the inhabitants; it is cultivated in the gardens in Spain, as an esculent fruit, by the title of Barenkeena; the Turks who also eat the fruit, call it Badinjan, the Italians Melonzana, and the inhabitants of the British islands in America, Brown John, or Brown Jolly.

It is an annual plant, with an herbaceous stalk, which becomes ligneous, and rises from two to three feet high, sending out many side-branches, decorated with oblong oval woolly leaves, whose borders are very slightly sinuated. The flowers have one petal, which is cut at the brim into five segments, which expand in the form of a star, but are a little reflexed; they are blue, and the summits, which are connected together in the bosom of the flower, are yellow; the flowers are succeeded by oval fleshy fruit, about the size and shape of a swan's egg, of a dark purple on one side, and white on the other.

There are two varieties of the second sort, one with a purplish fruit, and the other white: but the latter is the most common in England.

This plant is two foot and a half high, of an irregular growth and spreading; the stem is round, thick, and hairy; the leaves are large, and they stand upon long foot-stalks: they are broad at the base, smaller at the point, and irregularly waved at their edges; they are hairy, and their colour a pale green. The flowers are not of any great beauty: they are moderately large, and of a dusky white, with more or less of purple; the fruit

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which follows these, is of the bigness of a hen's egg, white, soft, and juicy.

The third sort differs from the two former in the shape of its leaves, which are deeply sinuated on their borders. The fruit is oblong and incurved, of a yellowish colour, and larger at the end than in any other part.

The fourth sort grows naturally in India: this differs greatly from either of the former; the stalk and leaves are armed with very strong thorns; the leaves are larger, and deeply jagged on their sides. The flowers are larger, and of a deeper blue colour; the fruit is long, taper, and white.

Culture of the EGG-PLANT.

They are propagated by seeds, which should be sown upon a moderate hot-bed early in March; when the plants come up, they must be transplanted in a second hot-bed, about three or four inches asunder, observing to water and shade them till they have taken root; after which, when the weather is warm, they must have a great share of air, otherwise they will draw up very weak; and they should also have frequent waterings.

About the end of May the plants will have grown so strong, as to fill the frame: they must then be transplanted out into a rich spot of ground, at two feet distance, or into the borders of the pleasure garden, at the same distance from other plants, observing to preserve as much earth to the roots as possible, when you take them up, otherwise they are subject to miscarry.

When the fruit appears, they must be watered more plentifully, not with a deluge at once, but by a moderate quantity often repeated; the beauty of these plants consists in the bigness of their fruit: and this depends greatly upon the due degree and equal quantity of moisture, and the choice of a good soil.

ELATERIUM, *Wild-Cucumber*. See the article **WILD-CUCUMBER**.

ELDER-TREE, *Sambucus*, a genus of plants, ranged by Linnaeus among the *pentandria trigynia*, and of which there are six species. 1. Elder, with a branching tree-like stalk, and flowers growing in umbels; or common Elder, with black berries. 2. Elder, with wing-pointed leaves, flowers growing in umbels, and a shrubby branching stalk, commonly called Parsley-leaved Elder. 3. Elder, with oval compound bunches of flowers, and a tree-like stalk; or Red-berried Mountain Elder. 4. Elder, with a branching herbaceous stalk, and the small leaves indented; or the Dwarf Elder, or Ebulus. 5. Elder, with an herbaceous branching stalk, and linear spear-shaped lobes, which are sharply indented; or Dwarf Elder, with a cut leaf. 6. American Elder, with leaves almost winged.

The first sort is the common Elder, which is too well known to need any description.

The second sort is generally titled Parsley-leaved Elder, and by some supposed to be only a variety of the first species.

The third sort grows naturally upon the mountains in Germany and Italy; this sends up many shrubby stalks from the root, which rise ten or twelve feet high, which divide into many branches, covered with a brown bark; the leaves come out opposite: they are of a pale green colour, and pretty smooth. The flowers come out at the end of the shoots, in oval bunches, which are composed of several smaller; they are of an herbaceous white colour, and are succeeded by berries, which are red when ripe.

The fourth and fifth sorts grow naturally in many of the midland counties in England, where they frequently become troublesome weeds.

The sixth sort is a native of Canada, and several other parts of North America, where it grows as large as our common Elder.

Culture of the ELDER-TREE.

All these sorts are propagated from cuttings planted any time from September to March; or by sowing their seeds, which, if permitted to fall on the ground, will produce plants the succeeding summer; the plants are very hardy and will rise in any soil or situation.

ELECAMPANE,

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ELECAMPANE, a species of the *Inula*. This plant grows naturally in many parts of England, but it is cultivated in gardens for the roots, which are used in medicine.

Culture of the ELECAMPANE.

It is propagated by seeds, which should be sown in autumn soon after they are ripe, for if they are kept till the spring they seldom grow; but when they are permitted to scatter, the plants will come up the following spring without any care, and may be either transplanted the following autumn, or if they are designed to remain they should be hoed out to the distance of ten inches or a foot each way, and constantly kept clean from weeds; these roots will be fit for use the second year.

ELM-TREE, *Ulmus*, a genus of plants ranged by Linnæus among the *pentandria digynia*, and of which there are three species. 1. Elm-tree with leaves doubly sawed, and unequal at the base, or the common Elm. 2. Elm-tree with leaves equally sawed, and unequal at the base. 3. Elm-tree with leaves equally sawed, and equal at the base.

The first species is a native of this and most other countries in Europe; the second grows naturally in Virginia, and the third in Siberia.

Culture of the ELM-TREE.

It is propagated either by layers or suckers taken from the old roots; but as these are often taken up with very bad roots, and are therefore very subject to miscarry, the method by layers is much the best, and is very easy to be practised, as a small space of ground would be sufficient to furnish nourishment for a number of stools or roots for laying, which would annually yield a great number.

The best soil for a nursery of this kind, is a moderately light and dry hazel-loam, and the best season for laying the branches is in autumn. When they have taken root, they should be removed from the old plant, and set in rows in nursery-beds, where, after four or five years, they will grow strong enough to be transplanted into the places where they are designed to remain. In the planting them, great care must be taken not to bury their roots too deep, which, when the soil is moist and stiff, often destroys them. The common Elm seldom produces seeds in great perfection, but the witch Elm produces great quantities of good ones, from which some people raise nurseries of the trees.

ENDIVE, a species of the *Cichorium* or *Succory*. This is an annual plant, and greatly cultivated in gardens, particularly a curled variety of it which is one of the principal ingredients in the fallads of autumn and winter: for which purpose it is cultivated as long as the season will permit.

Culture of the ENDIVE.

This plant is propagated by seeds, the first sowing of which should be in May, because those which are sown earlier in the year, generally run up to seed before they have arrived to a proper size for blanching. The second sowing should be about the middle of June, and the last in the middle of July. When the plants come up they must be kept clean from weeds, and duly watered; and when fit to be removed, the largest should be drawn up from the seed-bed, leaving the smaller ones to get more strength. These should be transplanted into an open spot of ground well dug and levelled, marked out in rows one foot asunder, and the plants set ten inches distant in the rows. The earth should be well closed to their roots and the plants well watered; the watering should be repeated every other evening till they have taken root; after which they must be kept clean from weeds.

When the plants of the seed-bed have been thus thinned, they should be well weeded and watered, and in about ten or fourteen days, there may be another thinning made of the remaining plants, which should be transplanted in the same manner; and, in about the same distance of time, a third and last drawing of the plants may be made, which must be done after the same method. Those plants which were first transplanted,

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will be fit to blanch by the end of July at farthest; and if they are properly managed, in three weeks or a month they will be sufficiently blanched for use. If any of the plants should put out flower-stems, let them be immediately pulled up; and carried away. The largest plants should be tied up first to blanch, and, in a week after, those of the next size. See the article **BLANCHING**.

In order to have a supply of these plants as long as the weather will permit, the plants of the last sowing should be transplanted under warm walls, pales, or hedges, to preserve them from the frost; and if the winter should prove severe, they must be covered with some peat-haulm, or other similar light covering, which should be constantly taken away in mild weather. The tying up the plants for blanching is only to be understood of the two first sowings, for the plants of the latter sowings should be taken up in a very dry day, with a large flat pointed dibble, and planted in the sides of trenches, where they must laid very upright, sideways towards the sun, with the tops of the plants only out of the ground, so that heavy rains may run off, and the plants be kept dry, and secured from frosts. These plants will be blanched fit for use in about three weeks or a month's time; after which they will not keep good long; for which reason fresh ones should be planted in the trenches every week or fortnight at farthest, that there may be a constant supply for the table; and those which were last transplanted out of the seed-beds ought to be kept till February or March, before they are planted to blanch.

In order to have a supply of good seeds for the next season, look over those borders where the last crop was transplanted before you put the plants into the trenches to blanch, and making choice of the largest, soundest, and best curled plants, let them be transplanted under a hedge or pale, at about eighteen inches distance in one row. If the season is mild this should be done about the beginning of March. When the flower-stems begin to advance, they should be supported by a packthread, drawing them upright close to the hedge or pale, that they may not be injured by high winds. Let them be kept clean from weeds, and about the beginning of July the seeds will begin to ripen.

ERINGO or **SEA HOLLY**, *Eryngium*, a genus of plants ranged by Linnæus among the *pentandria digynia*, and of which there are eight species. 1. Eringo with sword-shaped, sawed, spiny leaves, and the floral leaves ending in many points, commonly called Fever-weed. 2. Eringo with sword-shaped, spiny and indented leaves, with the floral leaves undivided, commonly called Rattle-snake weed. 3. Eringo with the lower leaves plain, oval, and crenated, with flower heads upon footstalks. 4. Eringo with oblong, lower, cut leaves, a stalk divided by pairs, and sessile heads. 5. Eringo with the lower leaves folded, roundish, prickly, and flower heads upon footstalks. 6. Eringo with oblong, heart-shaped, lower leaves, those upon the stalks wing-pointed, and cylindrical heads. 7. Eringo with lower leaves, winged and tripartite, or the common Eringo. 8. Eringo with the lower leaves digitated and multifid.

These are all perennial plants. The first species is a native of the West Indies. The second of Virginia. The third grows naturally in Russia, Poland, Austria, and Switzerland. The fourth kind is a native of Spain. The fifth grows in plenty on sandy and gravelly shores in several parts of England, and other countries near the sea. The sixth species is a native of the mountains of Switzerland and Italy. The seventh of England, France, Germany and Italy; and the eighth sort is a native of Syria.

Culture of the ERINGO.

The first species is propagated by seeds which should be sown on a hot-bed. When the plants are fit to be removed, they should each be planted in a small pot, and plunged in the bark-bed of the stove, and treated like other tender exotics.

The seeds of the second and sixth species must be sown in pots and plunged into a moderate hot-bed, by which

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which method the plants will come up much sooner, than those which are sown in the full ground, and be much stronger before the winter. When fit to be removed, plant them each into a separate small pot, filled with light earth; and if they are plunged into a moderate hot-bed, it will forward their taking root, after which they must be gradually inured to the open air, into which they should be removed about the end of May, and placed among other hardy exotics. When the plants have filled the pots with their roots, some of them may be shaken out, and planted in a warm border; the others may be put into larger pots, and in the autumn placed under a common frame, where they may be exposed to the free air in mild weather. The following spring these may be turned out of the pots, and planted in a warm situation, where they will endure the cold of our ordinary winters extremely well; but in severe frost they should be covered with straw or pease-haulm.

The third and eighth sorts are likewise propagated by seeds, which should be sown in autumn in the places where the plants are to remain. They require no other culture than to thin them where they grow too close and to keep them clean from weeds.

The fourth species is only cultivated in gardens for the sake of variety, and the fifth and seventh species are never admitted there at all.

ERIOCEPHALUS, a genus of plants for which there is no English name, and only one species.

This plant rises with a shrubby stalk from six to eight feet high, putting out many side branches. The leaves are hairy, they come out in clusters, and are divided into three or five parts, which spread open like a hand. This shrub seldom produces its flowers in our climate; but as it retains its leaves all the year, it adds to the variety of exotics in the winter season.

Culture of the ERIOCEPHALUS.

It is propagated by cuttings, which may be planted any time from May to the beginning of August; they should be shaded from the sun till they have taken root, after which they must be removed into the open air, and placed in a sheltered situation, where they may remain till October, when they should be removed into shelter, secure from the frost. In the summer, when the plants are in the open air, if the weather prove very hot, they will require to be frequently refreshed with water.

ESCULENT PLANTS are such whose roots are used for food; as Beets, Carrots, Parsneps, Potatoes, &c.

ESPALIERS, in gardening, are rows of trees planted in the manner of hedges; either to surround a whole garden, or the several quarters of it. They are trained up flat, in a close hedge, and serve not only for fruit bearing, but also to shelter the tenderer plants kept within the quarters. They are most commonly made of fruit trees trained up to a lattice of wood work, formed either out of ash-poles or square pieces of fir-wood, and their most useful office is the sheltering, and at the same time hiding the quarters of a kitchen garden.

The trees now principally planted for Espaliers, are Apples and Pears, and some Plums. The Apples intended for Espaliers, should be grafted on Crabstocks for large gardens, and for smaller on Codlin-stocks. The trees for the same hedge in an Espalier, should be all such as are of the same age from the grafting, and produced from the same stocks, that so the hedge may be the more regular. The more quick growing, and spreading ones, must be planted at twenty-two feet asunder, and those of smaller growth, at sixteen or eighteen; the walk between them in a large garden should be sixteen feet wide and if the Espaliers are intended to be carried up high it should be more that both hedges may have the benefit of the sun.

The best sorts of Apples for Espaliers, are the golden Pippin, the Nonpareil, the Rennet Grise, the Aromatic Pippin, the Holland Pippin, the French Pippin, Wheeler's Russet and Pile's Russet.

The Pears fittest for Espaliers, are the summer and autumn kind, for the winter ones never succeed well.

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These, if designed for a strong moist soil, should be grafted on Quince-stocks; but if for a dry soil more free stocks should be chosen. The distance for Peas grafted on free stocks should be eighteen feet, and for the most vigorous shooters, it ought to be twenty-five feet. The best kind of Pears for this purpose, are the Jargonelle, the Blanquette, the poire sans peau, the summer Boncretien, Humbden's Bergamot, the poire du prince, buerne du roy, the St. Michael, the le Marquis, the monsieur Jean, and the Cressant.

The third year after the trees are planted, the framework of the Espalier should be made. Till this time the young shoots should only be trained to upright stakes, nailing them with liff to different heights of these, as nearly as can be in an horizontal direction.

The best way of making the wood-work is of ash-poles, which are not only cheap, but strong and durable; the branches are all to be trained horizontally to these, and none should be suffered to cross one another, nor to come too near. In the trees which produce large fruit, no branches ought to be nearer to one another than eight inches, in the smaller fruited ones five or six inches is sufficient.

The advantages of trees planted in Espaliers, over those propagated as dwarfs, in the place of which these have been introduced, are many, and very great. They take up very little room in a garden, and are of no injury to the plants cultivated in the quarters; and the fruit is always more regularly ripened and better tasted, as the sun and air can have every way free access to it.

ETERNAL FLOWER. See the article *Eternal Flower*.

Indian EXACUM, a genus of plants ranged by Linnaeus among the *tetrandria monogynia*.

This is a most beautiful little annual. The root is long, slender, white, and hung with a few fibres. The stalk is round, erect, and at the top divided in a regular and elegant manner into a number of branches, which by their subdivisions form a large round head. The colour of the stalk is pale, often tinged with brown or red toward the bottom, and is lightly striated. The leaves are placed in pairs; they are small, of the lanceolate oval form. The flowers are small, but they are innumerable; they are elegantly placed, being spread all over the broad head by the subdivisions of the branches, and their colour is a bright gold yellow.

Culture of the EXACUM.

This plant in its natural state is found in dry and half burnt soils; therefore the most proper compost for it is pasture-earth with some sand, and wood-pile mould. A pot should be filled with this early in the spring, and the seeds scattered over the surface, and covered about a quarter of an inch with the same mould, set the pot up to the rim in a bark-bed, and let the mould at times be watered. When the plants have a little strength, let them be thinned by pulling up the worst, till there are only four or five left in the pot, or according to its size, as many as it can support. These must be by degrees accustomed a little to the air; and about the latter end of May they must be taken into the stove in the pot the seeds were sown in, for the plants should never be removed. They require moderate waterings, and will flower, and ripen their seeds perfectly.

EXOTIC PLANTS, all such as are natives of foreign countries.

EXPOSURE, in gardening, the situation of a garden wall, or the like with respect to the compass, as south or east. According to Mr. Miller, the best aspect or Exposure for walls in England, is to have one point to the eastward of the south; by reason these will enjoy the benefit of the morning sun, and be less exposed to injuries from the west and south-west winds, than walls directly facing the south. The next best aspect is due south, and the next to that south-east, which is preferable to the south-west for the reasons before assigned. However, as there will for the most part, be south-west and west walls in every garden, these may be planted with such sort of fruit as do not require so

much heat to ripen them; and wherever there are north walls, they are only fit for baking Pears, and Plums, Morello Cherries for preserving, or some duke Cherries, which may thus be continued longer in the season.



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FARINA FŒCUNDANS, the impregnating meal, or dust on the apices of flowers, which being dropped into the pistil, fœcundates the rudiments of the seeds in the ovary, which otherwise would decay and come to nothing.

FASTIGIATE PEDUNCLES, &c. such peduncles, &c. as are so proportioned that the flowers which they support form an even surface.

FEBRUARY, the second month in the year.

In the flower garden continue, throughout the whole ground, the care directed for the month of January. For fear of accident among the seedlings, sow fresh quantities. The Polianthus, and the Auricula seed, will yet grow very well on common ground. Clean the borders, and break the top of the mould, to promote the shoots of the plants; but this must be done with the greatest care. No person should be entrusted to hoe the borders at this season, but he who planted the roots in them.

When the ground is cleaned, and stirred at the surface, let a small quantity of very rich mould be sifted over the roots. Where Roses, Honey-suckles, or other small flowering shrubs, in borders are wanting, let them be brought in the beginning of this month. If the plantations of the fibrous rooted kinds have been omitted in autumn, or if the wetness of the ground has rendered it more proper to be delayed till this season, bring now in the several kinds of golden rods; and after these plant Columbines, Sweet Williams, and the scarlet and other *Lychnis*'s. If the autumn plantation has been made, look over the ground and see that all holds good. Where a root seems decayed, take it up and place another; and where any one only appears weak, take it back into the nursery, and put a stronger one into the place. Look over the Box-edgings, and if there be any bad part not amended in autumn, or if any of what was planted at that time seem weak, take the pieces up and mend them. Close the earth very well about the roots of what is new planted. The middle of this month is a proper time for sowing the tender annuals upon hot-beds. About this time the Carnations, from which a shew of flowers is expected this season, are to be potted. The Auricula plants will about the end of this month, shew their buds for flowering: stir the earth lightly, on the surface, in all the pots. See if any thing has missed, which was planted in autumn, or if there be any vacancy which was left unsupplied at that time. In such places now plant the perennial Catch-flies, Fox-gloves and *Gentianellas*. Clean the gravel-walks and roll them hard. Let all the plants and trees be cleaned; let the dead leaves be picked, and all filth, whether from insects, mouldiness, or whatsoever kind be washed away.

In the seminary prepare borders for sowing flowering plants in the open ground; let two or three pieces in different parts be dug up, and the mould thrown in ridges, east and west, to receive the benefit of the air; whilst this soil is mellowing, let another piece be dug up, for the immediate reception of layers of hardy trees; such as were not sufficiently rooted in autumn, may be taken off now; sow seeds and fruits of hardy shrubs the beginning of this month; clear a piece of ground for planting evergreens: and about the middle of this month, if it be mild weather, get all the hardy kinds of trees and shrubs into the ground. Plant cuttings of Currants and Gooseberry-bushes, if not done in autumn. Dig the ground about such trees as have stood some time in

their place. Where the intended trees for this season's transplanting are not in the ground, let the places be prepared, and a mild day, after frost, chosen for that business. If it be now severe frost, let the ground all about the cuttings of Gooseberries and Currants, be covered with pease-straw.

The green-house will now require great care; air and water, that have been withheld so long on account of the severity of the weather, must now be admitted more freely; for if the air be mild, the middle of the days warm, and the nights not very sharp, let this needful assistance be given the plants; the shooters must be kept back for the first day or two: and the next the glasses must be opened a little; the waterings are to be repeated occasionally; let some mould suited to the nature of the several kinds of plants, be brought into the green-house; and two or three days after that, let the mould on the surface of the pots and tubs, be carefully stirred with a blunt trowel: and when it is well loosened to some little depth, let so much be taken off, and the place of it supplied with the fresh mould. Cleanliness is the next to be regarded; let such plants as are tainted be removed out of the green-house, into some other place of shelter: then let all dead or decaying leaves be carefully picked off; and if foulnesses of any kind, mouldiness, or insects, be found on any of the leaves or branches, let it be washed and wiped away; let the same care be observed in the stove: this is a good season for producing new plants; the more delicate and tender kinds, intended for the stove and green-house, are to be raised in the bark-bed.

In the fruit-garden look over those stocks which were budded the preceding summer. If the heads be cut off, see the sap from the wound do not run upon the bud; those not cut off before must be cut now. Go over the espaliers lately repaired, and see that every thing keep firm. Sow the stones of Plums and other hardy fruit, for raising stocks for the future service of budding and grafting.

The planting of fruit-trees is a work of this season, and no care is too much in the operation.

About the end of this month, if the season be mild, you may graft pears. See that the fruit-trees newly planted have a right pruning.

In the kitchen-garden, about the beginning of this month, sow a fresh piece of ground with Beans, and another with Peas. Sow a little fresh Cucumber-seed, and repeat the same once in ten days. Dig a good piece of ground for Carrots and Parsneps. About the middle of the month sow a bed of Onions, and another of Leeks. Lay a small piece level and fine for Cabbage Lettuce-seed. Make a small hot-bed for Cauliflower-seed, and sow Cos and Silesia Lettuce-seed. About the end of this month, begin sowing Cabbages and Savoy for winter. Look to the beds of the finer kinds of Lettuces; the plants will now be ready to remove. Dig three pieces of ground, and laying them perfectly level, on the one sow Raddish-seed, on the other Spinach, and on the third Lettuce. Dig a piece of ground under a warm wall, and sow young fallading. Beets should now be sown for a large crop. Plant Rocombole, and all the onion kinds; with good care there is no season wherein things grow more freely: but without this care no season is so dangerous.

FELLWORT. See the article *GENTIAN*.

FENCES. In the warmer climates, where they have not occasion for walls to ripen fruit, the gardens lie open, and are bounded by a water fence and an agreeable prospect; or else they terminate in groves, adorned with fountains, walks, &c. which are more pleasing than a dead wall; but in this and other colder countries, we are obliged to have walls to ripen and shelter our fruit: for the manner of building which, see the article *WALL*.

Where there are no walls, the common method, in this country, of fencing a good piece of ground, is by quick-hedges; for the method of which, see *HEDGES*.

FENNEL, *Fœniculum*. This is a biennial plant, and too well known to need a particular description here.

Culture

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Culture of the FENNEL.

This plant is propagated by seeds, which should be procured from Italy, for those ripened in England are very apt to degenerate. In February some of these should be sown for the first crop, on a light dry soil, and in a warm situation. The manner of sowing these seeds is first to rake the bed very smooth, then draw a small drill along it, and in this scatter them pretty thin; for the plants are not to stand nearer than six inches to one another; cover this with half an inch of earth: and at the distance of sixteen inches, make another drill, and so on throughout the bed.

In about a month the plants will come up, they must then be cleared of weeds, and cut up to four inches distance; a month after this they must be thinned to six or seven inches distance; the stalks will now begin to swell to a large bulk just above the ground: this part must be earthed up in the manner of Celery, about a fortnight before it is used, which will make it eat very tender and crisp.

A second crop should be sown three weeks after the first, and in the same manner till July, every three weeks or a month, a new crop should be sown, to keep a constant supply for the table.

The crops sown in the hotter weather should be watered and shaded from the great heats.

FENNEL-GIANT, a genus of plants, of which there are eight species. 1. Pliny's Female Fennel-giant. 2. Galbanum, bearing the Fennel-giant of Lobel. 3. Broad-leaved Shining Fennel-giant from Tangier. 4. Fennel-giant, with a broader leaf. 5. Eastern Fennel-giant. 6. Eastern Fennel-giant, with a spiguel leaf, and yellow flower, called Laserwort. 7. Fennel-giant, commonly called Libanotis. 8. Fennel-giant, with a narrow leaf.

The first species is very common in the English gardens, and if planted in a good soil, will grow to the height of ten or twelve feet.

The second sort does not grow quite so large as the first, but the stalks of this will rise seven or eight feet high.

The third species is a native of Spain and Barbary, and rises to the height of eight or ten feet.

The fourth sort grows naturally in Sicily, and rises to much the same height as the second species.

The fifth and sixth sorts are natives of the Levant, and of much humbler growth than either of the former.

The seventh species grows naturally in Istria and Carniola, and rises about three feet high.

The eighth sort is a native of Spain, and grows to the height of eight, and sometimes nine feet.

Culture of the FENNEL GIANT.

All these species are propagated by seeds, which should be sown in the autumn, for if they are kept out of the ground till the spring, they frequently fail, and those which succeed remain a year in the ground, so that much time is lost. The seeds should be sown in drills, by which method the ground may be easier kept clean; the drills must not be nearer than a foot, and the seeds may be scattered two or three inches asunder in the drills.

When the plants come up if they should be too close together, they should be thinned to allow them room to grow, for they will not be strong enough to remove till they have had two years growth; then in the autumn when their leaves are decayed, the roots should be taken up with great care, so as not to cut or injure the tap or downright root, and planted in the places where they are designed to remain, for after this transplanting they should not be removed.

As these plants spread very wide, so they should have each four or five feet room, nor should they stand near to other plants, for their roots will rob whatever grows near them of its nourishment. They delight in a soft, loamy soil not too wet, and are very rarely injured by the hardest frost.

Scorching FENNEL, or *Deadly CARROT*, *Thapsia*, a genus of plants ranged by Linnæus among the *pentandria digynia*, and of which there are six species. 1.

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Scorching Fennel, with indented lobes which are joined at their base. 2. Scorching Fennel with winged leaves, having very broad wing-pointed lobes, which are hairy on their under side, and running footstalks. 3. Scorching Fennel with many-pointed lobes, which are narrowed at their base. 4. Scorching Fennel with many-pointed bristly lobes. 5. Scorching Fennel with oval trifoliate leaves. 6. Scorching Fennel with many-pointed acute lobes, which are hairy on their under side, and have hairy footstalks.

The first sort grows naturally in Spain, Portugal, and the south of France. It rises with a spungy stalk about two feet high, dividing upward into two or three small branches, each being terminated by a large umbel of yellow flowers.

The second sort grows naturally in Spain, particularly all over old Castile. The stalks rise three or four feet high; they are large, jointed, and full of pith, and the flowers come out from the top of them in large yellow umbels.

The third sort grows naturally in Italy and Spain. The stalks are about two feet high, and are terminated by umbels of small yellow flowers.

The fourth sort grows naturally in Apulia. The stalk rises from two to three feet high; it is naked and branches into two or three stalks, each being terminated by a small umbel of large yellow flowers.

The fifth sort grows naturally in North-America. The stalk is single and does not branch, it rises near two feet high, and is terminated by a small umbel of purple flowers.

The sixth sort grows naturally in Austria. The stalk rises about two feet high, and is terminated by an umbel of yellow flowers.

Culture of the Scorching FENNEL.

These plants are only propagated by seeds, which should be sown soon after they are ripe, in drills, in the places where they are designed to remain. Let the drills be at least two feet and a half asunder, and when the plants come up in the spring, they should be carefully cleaned from weeds, and thinned where they grow too close, so as to be left two or three inches asunder. In the autumn following, they may be thinned so as to stand at the distance of eighteen inches apart; the plants which are taken up may be transplanted to another bed, if they are wanted.

They will afterwards require no other care but to keep them clean from weeds; and every spring just before the plants put out new leaves, to dig the ground between them, taking care not to injure their roots. They should have a soft loamy soil.

FENNEL-FLOWER, See *DEVIL-IN-A-BUSH*.

FICOIDES, See the article *FIG MARIGOLD*.

FIDDLE WOOD, *Citharexylon*, a genus of plants of which there are two species. 1. The common Fiddle Wood of America. 2. Fiddle Wood with oblong, oval, entire leaves growing opposite, angular branches, and flowers growing in spikes.

The first sort grows common in most of the islands of the West-Indies, where it rises to a great height, and becomes a very large timber tree, the wood of which is greatly esteemed for buildings, being very durable.

The second sort is a native of the same islands with the first. This tree rises with a strong upright trunk to the height of sixty feet, or more, sending out many angular branches. The timber of this tree is also greatly esteemed by the Americans, being very durable.

Culture of the FIDDLE WOOD.

The seeds of both these sorts should be sown in small pots early in the spring, and plunged into a hot-bed of tanners bark, and treated in the same manner as other exotic seeds which are brought from hot countries. If the seeds are fresh the plants will appear in five or six weeks, and in about one month more will be fit to transplant; when each should be planted, in a small pot, and plunged into the hot-bed again, observing to shade them till they have taken fresh root, after which they should have a large share of air in warm weather. In autumn the plants should be removed into the bark-stove, where it

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it will be proper to keep them the first winter, till they have obtained strength, but afterward they may be kept in a dry stove in winter, and in the middle of summer they may be exposed in the open air for two months, in a warm situation, with which management the plants will make better progress than when they are more tenderly treated.

If the cuttings of this plant are set in small pots during the summer months, and plunged into a moderate hot-bed, they will take root, and may afterward be treated in the same manner as the seedling plants.

FIELD BASIL, *Clinopodium*; a genus of plants ranged by Linnæus among the *didynamia gymnospermia* and of which there are three species. 1. Field Basil with roundish prickly heads, and bristly bractæa or the common Field Basil. 2. Field Basil with leaves woolly on their under side, broad plain whorls, and spear-shaped bractæa. 3. Field Basil with rough leaves, plain heads growing on the sides of the stalks, which have foot-stalks and are radiated.

These plants have perennial roots. The first species grows naturally in rocky places in the north part of Europe and America. The second sort is a native of the north parts of Europe, and the third species grows naturally in Carolina, Jamaica, and the south of France.

Culture of the FIELD BASIL.

They are propagated by parting of the roots or sowing the seeds in autumn, and require no other culture than being kept clean from weeds; the first and second sorts will grow in any soil or situation; but the third species should be planted in pots, and in winter sheltered under a frame, where the plants may have the benefit of the free air in mild weather, and be protected from frost.

FIG TREE, *Ficus*, a genus of plants ranged by Linnæus among the *polygamia triœcia*, and of which there are the seven following species. 1. Fig Tree with hand-shaped leaves, or the common Fig Tree. 2. Fig Tree with roundish, heart-shaped entire leaves, commonly called Sycamore. 3. Fig Tree with entire heart-shaped leaves, ending in acute points. 4. Fig Tree with oval, obtuse, intire leaves, and the lower part of the stalk putting out roots. 5. Fig Tree with spear-shaped leaves upon footstalks; the footstalks of the fruit growing in clusters, and branches sending out roots. 6. Fig Tree with oval, intire acute leaves; a tree like stalk and branching fruit. 7. Fig Tree with oval, acute intire leaves, and a creeping stalk.

Of the first species, which is the only one worth cultivating, and is a native of Asia, and the southern parts of Europe, there are great varieties, which have been obtained from seeds, and may be increased annually.

Of these varieties, the following are observed to be most worthy of cultivation.

1. The brown, or chestnut-coloured Ischia Fig. It ripens in July, or August, and, if planted against a wall, two plentiful crops of fruit may be annually ripened.

2. The Black Genoa Fig, being a long fruit, the inside of a bright red, and the flesh very high flavoured, and ripening early in August.

3. The small, white, early, Fig.

4. The large, white, Genoa Fig.

5. The Black Ischia Fig, ripening in August.

6. The Malta Fig, being a small, brown, fruit, which, if permitted to hang upon the trees, till the fruit is shrivelled, becomes a fine sweetmeat.

7. The Murrey, or brown Naples Fig, ripening the latter end of August.

8. The green Ischia Fig, ripening about the end of August.

9. The Madona Fig, commonly called here the Brunswick, or Hanover Fig, ripening the end of August, or beginning of September.

10. The common Blue, or Purple Fig.

11. The brown Fig of Naples, ripening in September.

12. The Yellow Ischia Fig.

13. The small brown Ischia Fig, which, together with the twelfth sort, ripens in September.

14. The Gentile Fig, ripening very late.

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Culture of the FIG TREE.

The common method has been to propagate these trees by suckers from the roots of the old ones, but they are much more successfully raised from cuttings. The branches may be laid down in February, and by the same month in the following year, they will be fit to remove. This is also the proper season to transplant them; and the best soil is such as has a gravelly, chalky, or stony bottom, with a light surface; the tree indeed will seem to flourish more in a better soil, but in this poor one it will produce the finest and most plentiful fruit.

Fig Trees should always be planted in a free open situation, not shaded by trees or buildings, and they never ripen their fruit well unless against a good south-east, or south-west wall. They should be planted at twenty feet distance, and the proper height for the wall they stand against, is about fourteen feet; the middle spaces between the trees may be planted with vines, to fill up the vacant part of the wall till the figs are grown, after which the vines should be taken away.

In the summer, as the branches shoot, they must be trained horizontally against the walls, and no fore right shoots should be suffered to come, but the buds of such should be rubbed off as fast as they appear. At Michaelmas they should be always pruned and nailed up. The great care to be had in pruning the old trees, is always to have a supply of young branches, for it is those only which produce fruit. None of the shoots of the former autumn pruning must be shortened, for it is on the two year old wood, that the fruit is produced; the young branches must be always brought very close to the wall, and this will screen them from injuries by frost, and much forward the early ripening of their fruit. The old branches should never be laid in too thick; the distance ought to be at least a foot between branch and branch, and as the young ones grow strong, the old ones should always be cut away. In April or the beginning of May, several of the leading shoots should be stopped, which makes them throw out side-branches. In very hard weather the trees should be covered with straw, pease-haulm, or the like; which is not to be removed till the weather is milder, and then not all at once, but only by a little at a time. The higher the wood runs up the wall, usually so much the better tasted is the fruit; and no trees succeed better in fruiting, than those which are nailed up against chimneys, where beside the height they have some advantage from the heat.

The Fig-tree does not love culture as most other fruit-trees do, it covets none at all, or very little; for it is a certain rule, that the more we dig about it, the less fruit we have from it, and it runs all into wood; it delights most in stony ground. The wood of the Fig-tree is close set with buds, which yearly produce fruit; the sap of this tree is too vigorous to want any help, or any enrichment, but rather is kept to bearing by laying sand at the root, which helps to bring the fruit forward; the ashes of lye, or buck-ashes, are extremely good to lay at the roots of fig-trees, and have an excellent effect; they kill weeds, warm the earth, and set the tree to bearing plentifully.

As the other species of the Fig-tree do not produce fruit that is eatable, even in their respective native countries, they are preserved only in the gardens of the curious, for the sake of variety.

Indian FIG, or *Prickly PEAR*, *Opuntia*, a genus of plants of which there are nine species. 1. Indian Fig with oval compressed joints, and bristly spines, or the common Indian Fig. 2. Indian Fig with oblong oval joints, and bristly spines. 3. Indian Fig with oblong oval joints, and awl-shaped spines. 4. Indian Fig with oblong oval joints, and very long black spines. 5. Indian Fig with oblong oval thick joints, and unequal spines. 6. Indian Fig with oblong oval joints, almost without spines, commonly called the Cochineal Fig. 7. Indian Fig with compressed, cylindrical, bellied joints, and bristly spines, called Pinpillow. 8. Stalky Indian Fig with large, narrow, compressed leaves, armed with long, narrow, white spines, growing in clusters, called

Robinson

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Robinson Crusoe's Coat. 9. Indian Fig with compressed sword-shaped joints, whose indentures turn backward.

These plants are all natives of America, and, except the first sort, are too tender to thrive in the open air of our climate, nor can any of them be preserved through the winter here, unless they have artificial heat; for when they are placed in a green-house, they turn to a pale yellow colour, their branches shrink, and frequently rot on the first approach of warm weather in the spring.

Culture of the INDIAN FIG.

These plants may all be propagated by cutting off their branches at the joints, during any of the summer months, which should be laid in a warm dry place for a fortnight, that the wounded part may be healed over, otherwise they will rot. The soil in which these cuttings should be planted must be composed after the following manner: one third of light fresh earth from a pasture, a third part sea-sand, and the other part should be one half rotten tan, and the other half lime rubbish; these should be well mixed, and laid in a heap three or four months before it is used, observing to turn it over at least once a month, that the several parts may be well united; then it should be passed through a rough screen, in order to separate the largest stones and clods, but by no means sift it too fine.

Fill some pots with this compost, first laying some small stones at the bottom to keep an open passage for the water to drain off, then plant one of the cuttings into each pot, and, except those of the first sort, plunge them into a moderate hot-bed, which will greatly facilitate their taking root; they should also be now and then refreshed with a little water, -but great care must be taken not to give them too much, or too often, especially before they are rooted.

When the plants begin to shoot, they must have a large share of air, otherwise their shoots will draw up so weak, as not to be able to support themselves; and after they have taken strong root, they should be inured by degrees to the open air, and then removed into the stove, where they should remain. They must be placed near the glasses, which should always be opened in warm weather, so that they may have the advantage of a free air, and yet be protected from wet and cold.

During the summer season these plants will require to be often refreshed with water, but it must not be given them in large quantities, lest it rot them; and in winter this should be proportioned to the warmth of the stove, for if the air be kept very warm, they will require to be often refreshed, otherwise their branches will shrink; but if the stove be kept in a moderate degree of warmth, they should have but little, for moisture at that season will rot them very soon.

These plants thrive best in a temperate heat, for if they are kept too warm in winter, it causes their shoots to be very tender, weak, and unsightly. Those sorts which are inclinable to grow upright, should have their branches supported with stakes, otherwise their weight is so great as to break them down.

The first species may be treated in the above manner, only it does not require the heat of a stove, and will thrive extremely well through winter in a green-house.

FILAMENTS. See **STAMINA.**

FILBERT, a species of the Hazel or Nut-tree. See **HAZEL.**

FILM, a woody skin, separating the seed in the pod of plants.

FIMBRICATED, a term applied to such leaves of plants as are jagged on the edges, and have, as it were, a fringe around them; they are sometimes called furberlowed leaves.

FINGRIGO, *Pisonia*, a genus of plants of which there is but one species in England; though the male and female plants differ so much as to be sometimes taken for distinct species, by those who have not seen them raised from the same seed. The male plants have stalks as thick as a man's arm, which rise ten or twelve feet high; the bark is of a dark brown colour, and smooth;

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these send out many branches opposite, which are much stronger than those of the female, and are decorated with oval stiff leaves, standing opposite on short footstalks.

The stalks of the female plants are not so strong as those of the male, so require support. These rise eighteen or twenty feet high, sending out slender weak branches opposite, armed with short strong hooked spines, and decorated with small oval leaves, standing opposite on the larger branches, but on the smaller they are alternate, and have short footstalks.

These plants are very common in the Savannas, and other low places in the island of Jamaica, as also in several other islands in the West-Indies.

Culture of the FINGRIGO.

It is propagated by seeds, which should be sown in pots filled with light rich earth, and plunged into a hot-bed of tanners bark; and when the plants come up, they should be transplanted into separate pots, and plunged into the hot-bed again, where they may remain till Michaelmas, when they should be removed into the stove, and plunged into the bark-bed, and treated in the manner of other tender plants from the same country.

FIR-TREE, *Abies*, a genus of plants of which there are five species. 1. The Silver, or Yew-leaved Fir. 2. The Spruce or Norway Fir, sometimes called the Pitch-tree. 3. The small coned American Spruce Fir. 4. The White Spruce Fir of North-America, called Newfoundland Spruce. 5. The American Hemlock Fir.

The first sort grows naturally in many parts of Germany, but the finest trees of this sort grow upon mount Olympus, which produce fruit of an extraordinary size. The Strasburgh turpentine is drawn from this tree. The wood is white and soft, and therefore not greatly esteemed.

The second sort grows naturally in the low lands of Sweden, Norway, and Denmark, as also in many other parts of Europe. This is sometimes titled Red Fir. The young branches of this Fir are used to make Spruce Beer in Germany, and from thence had the title of Spruce Fir.

The third sort grows naturally in many parts of North America, and from thence have been brought to England.

The fourth sort is also a native of North America, where the inhabitants make three sorts of it, by the titles of Black, White, and Red Spruce. In England they are mostly known by the title of Newfoundland Fir, because many of their cones have been brought from thence; but the trees are found growing in most parts of North America.

The fifth sort is also a native of the same country; and in the northern parts of America it is said to grow to be a very large tree; but in England the branches spread wide every way, so that there is no appearance of the trees ever arriving to any considerable height.

There are several varieties of these trees, which have been raised from seeds which came from North America, particularly the Balm of Gilead Fir, which is so near resembling the first species, as scarcely to be distinguished from it.

Culture of the FIR-TREE.

All the sorts of Fir are propagated by seeds; the time for sowing them is about the middle of March, when the season is mild, otherwise it had better be deferred till the end of that month, or the beginning of April. The seeds which are preserved in their cones, are much better and will keep good longer than those which are taken out; but the cones of the Silver and Balm of Gilead Firs generally fall to pieces in the autumn, soon after the seeds are ripe; so that if they are not carefully watched at that time, and gathered, the seeds will be lost. The best method of opening the cones, is to spread them on a cloth a few hours before the fire, when they will open and emit their seeds.

These seeds may be sown in boxes, or pots filled with light fresh earth, covering them over about half an inch thick with the same earth; these should be placed to an east aspect, where they may have the sun till eleven in

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the morning; or if the seeds are sown in a bed of earth, it should be shaded with mats in the middle of the day; for when they are too much exposed to the sun, the surface of the ground will dry so fast, especially in hot seasons, as to hinder the seeds from vegetating; and when the plants begin to appear, if they are not screened from the sun, many of them will be soon destroyed. The seeds must be carefully guarded against mice and birds, who are very fond of them, but particularly when the plants begin to appear; for as they thrust up the cover of the seeds on their top, so the birds in pecking off these covers, will destroy the young plants; therefore the surest method is to cover them with nets until the plants have thrown off their husks, and expanded their seed-leaves, soon after which they will be out of danger.

The plants may remain in the places where the seeds were sown till the following spring, provided they are not stunted by the stiffness of the ground, or any other cause; if so, they had better be carefully transplanted into new beds about the beginning of July; but this must be done with great care, observing to raise the plants with a trowel, so as to preserve their roots as entire as possible, and to plant them again immediately, otherwise their tender fibres will soon become dry when exposed to the air at this season, and the plants thereby destroyed.

The distance for setting these young plants should be four inches row from row, and about three inches asunder in the rows; for as these beds must be arched over with hoops, that the plants may be shaded with mats in the middle of the day: so the closer they are planted, the less expence there will be in the covering; and as the plants are to remain in this bed no longer than the following year, there will be room enough for their growth during that time; these young plants must be carefully weeded, for if weeds are permitted to grow among them of any size, there will be great danger of drawing the plants out of the ground with the roots of the weeds. If the season proves very dry, it will be of service to the plants to sprinkle them over with water once or twice a week during the hot time of the year: but this should be done with caution, for too much wet will rot the shanks of these young plants, and destroy them.

These plants are very rarely hurt by frost, especially those in the full ground; but such as are in pots or tubs, are in more danger, if they stand upon the surface of the ground: for the frost will penetrate through the sides, and thereby injure their roots; therefore these should either be sunk into the ground before winter, or some old tanners-bark, straw or mulch, laid round the pots or tubs, to keep out the frost.

After the young plants have remained in the seed-bed one year, they may be transplanted into beds the April following: but as these which were not transplanted in summer from the places where they were sown, may stand two years in the beds when transplanted, so they should be allowed more room than those which were removed the preceding summer; therefore the rows may be from five to six inches distant, and the plants in the rows four inches asunder, observing to treat them in the manner before directed. When they have grown two years in these beds, they may be transplanted into the nursery, placing them in rows three feet distant, and a foot asunder in the rows.

The best season for removing them is in April, just before they begin to shoot: though they may, and often are transplanted in autumn with success, but spring is preferable, especially if there happens to be rain soon after, otherwise they will require watering once a week for about a month.

The smaller these trees are planted out where they are to remain, the greater will be their progress, and they will grow to a much larger size than those that are removed when older; they are frequently planted out at the height of six or eight feet, at which size they will transplant better than most other evergreen trees; but if they are not supported, they will be in danger of being blown down by the wind. And if trees of such sizes are

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to be carried to a distant place, it will be expensive; for unless they have large balls of earth to their roots, there will be great hazard of their growing; and these will require more water than young plants: so that upon the whole, planting of young trees is much preferable and less expensive; therefore, where there are large plantations to be made, planting the trees very young is the most eligible; for the expence of cleaning these young plantations, will not be equal to that of staking and securing tall trees; and the difference of the first price, together with the carriage of the latter, will be very considerable; and the former will in a few years outgrow the latter.

In the choice of the plants, if they are to be purchased from a nursery, they should not be taken from good land to plant in a poor soil. The best method, where large plantations are to be made, is, if possible, to make nurseries on the same ground, where the trees should be raised from seeds; for as the distance will be small to remove them, there will be little danger of their succeeding.

The timber of these trees is held in very little esteem: therefore they are only valuable for their beauty, so that when they are planted for ornament, they should be placed so far asunder, as to admit the free air between them, otherwise the lower branches will decay, and render the trees unsightly. The great beauty of these trees consist in their pyramidal form, and being furnished with lateral branches from about seven feet above the surface of the ground to their top; and these branches should be well decorated with leaves: to obtain which, the trees should not be planted nearer than eighteen or twenty feet; for when they are closer, the under branches soon drop their leaves and decay; and if these branches are taken off, the trees never put out new ones to supply their place.

In pruning off the under branches to the designed height, care must be taken not to cut off too many branches at the same time; one tier of branches is full enough to be displaced in a year; and if this is performed every other year, it will be sufficient; and by this gradual method of pruning, the trees will not be much retarded in their growth; the best time for this operation is in the beginning of September.

The Silver Fir requires a deep strong soil: for if it is planted in a light ground, it will make but little progress; and when it is planted in a shallow ground, as soon as the roots meet with obstruction, the trees generally decay.

The common Spruce Fir will thrive best on the same land: but this will also do well on light ground, where the other will make little progress; for this reason, and being of longer duration, it is more generally planted in England than the former.

The third sort will succeed best on a moist soil; for in light dry ground it makes but little progress: nor does it make a good appearance where the soil is not proper for its growth.

The American Spruce Fir delights in light moist ground, where the trees grow to a large size, and make a beautiful appearance; and if they are allowed room for their lower branches to spread and extend, they will be garnished with them almost to the ground, forming themselves in a pyramidal figure.

The Hemlock Fir thrives best in a strong loamy soil; those which have been planted in light dry ground, have made but little progress, especially upward, their branches taking a lateral position: so that unless the upper shoot is trained to a stake to direct its upright growth, the leading shoot will turn on one side and become flat.

Sometimes these trees are propagated from cuttings, which if properly planted will take root; but the plants so raised will never arrive to near the size of those raised from seeds; they are also never inclined to an upright growth, sending out many lateral branches, and becoming bushy; therefore this method is only worthy imitation when it is to propagate a curious sort, whose seeds cannot be obtained; nor should the inarching of

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one sort upon another be attempted; for the trees so propagated will be of slow growth, and of short duration.

Scotch FIR, a species of the Pine-tree. See the article *PINE-TREE*.

Corn-FLAG. See *CORN-Flag*.

Sweet-smelling-FLAG, *Acorus*. See *ACORUS*.

African FLEABANE, a genus of plants, of which there is but one known species.

This plant grows naturally at the Cape of Good Hope, it has a strong woody stalk, which rises to the height of twelve or fourteen feet, sending out many ligneous branches at the top. The flowers are produced in spikes at the extremity of the shoots, which are of a dull purple colour, so make very little appearance; the usual time of its flowering is in autumn, and continues great part of the winter; these plants retain their leaves all the year, and are therefore preserved in the green-house, by the curious, for the sake of variety.

Culture of the African FLEABANE.

It may be propagated by cuttings, which should be planted in May, in pots filled with light earth, and if they are plunged into a moderate hot-bed, it will promote their putting out roots. These should be shaded with mats, or covered with oiled paper, to screen them from the sun till they are rooted, which will be by the middle of July; they should then be each transplanted into a separate pot, and placed in the shade till they have again taken root; after which they may be placed with other hardy exotic plants in a sheltered situation, where they may remain till the middle or end of October, when they should be removed into the green-house, placing them where they may have a large share of air in mild weather. These plants require frequent waterings, and every year they must be shifted, and, as they increase in size, should be put into larger pots.

FLESH, among botanists expresses all the substance of any fruit, between the outer rind and the stone; or as much of the root of any plant as is eatable.

FLORET, *Flosculus*, a little tube expanded at the top usually into five segments, and settling upon the embryo of a single seed. See the article *FLOWER*.

A *Semi-Floret*, or *Half-Floret*, is tubulous at the base, and afterwards expanded in the form of a tongue. These generally form the rays of compound flowers and are female.

FLORIST, a person skilled or conversant in flowers.

FLOSCULUS, in botany, a term used by Mr. Tournefort, and others, to express such flowers of plants, as are composed each of a great number of other smaller flowers placed close to one another and enclosed in the same common cup: each of these smaller flowers consist of one petal, which is slender and hollow, wider than the bottom, and usually divided into many segments, which sometimes are disposed in the form of a star. Each of these flowers stand upon an embryo, or young fruit, from which there grows a capilament which reaches beyond the flower. These embryos are lodged in the bottom of the cup which is called by authors the *thalamus* of the flower, and finally become seeds winged with down, or sometimes without that, and sometimes are armed with prickles. Of this sort are the flowers of *Thistles*, *Knapweed*, &c.

FLOWER. Though no part of plants is more known than their flowers, yet the definitions given by different authors of the word are extremely various, and are very necessary to be explained, in order to the understanding their works. Jungius defines it to be the most tender part of a plant, remarkable for its colour or form, or for both, and cohering with the fruit. Yet this author himself, acknowledges his definition to be too confined, as he very well knew there were several plants, whose flowers were produced remote from the fruit.

Mr. Ray says, the flower coheres for the most part with the rudiments of the fruit, but such phraseology is by no means to be admitted into definitions. Tournefort defines it to be a part of a plant very often remark-

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able for its peculiar colours, for the most part adhering to the young fruit, to which it seems to afford the first nourishment, in order to explicate its most tender parts, but this is a more indeterminate definition than the former, from its loose mode of expression. Pontedera defines it to be a part of a plant, unlike the rest in form and nature. If the flower has a tube, it adheres to, or is fixed very near to the embryo, to the use of which it is subservient; but if the flower has no tube, then its base does not adhere to the embryo. This is scarce intelligible except to the expert botanist, and may be made to take in some parts of plants by no means to be understood by the name flowers. Jussieu defines it to be composed of chives and a pistillum, and to be of use in the generation of the plant: but this is too imperfect, as there are many plants in which the pistillum is found at a great distance from the chives, and many flowers which have no pistillum, and many others which have no chives.

Valliant, however, has been happier in his definition; he says, that flowers are the organs which constitute the different sexes of plants, which are sometimes found naked and without any covering; and that the petals, which most of them have, are no way essential to their use, but serve and are intended merely as covers for them; but as these coats or coverings are the most conspicuous, and most beautiful part of the flower, these are to be called flowers, be they of whatever form or structure, or colour; and whether they contain only the organs of both sexes in each individual, or only of one, or even but of some part of one, provided that they are not of the same figure and colour with the leaves of the plant. The shortest and most express definition, however, seems to be Martyn's; which is, that flowers are the organs of generation of both sexes, adhering to a common placenta, together with their common covering, or of either sex separately with its proper coverings, if it have any. The structure of the different flowers are very various; but Dr. Grew has observed, that the far greater number of them have the impalement, the foliation, and the attire of chives, &c. Mr. Ray accounts that every perfect flower has the petals, stamina or chives, apices or summits, and the style or pistil, and such as want any of these parts he calls imperfect flowers. The greater number of plants have a flower cup which is of a firmer structure than their leaves, and serves for their support. The parts of a flower are the ovary or pistil, the corolla or flower-petals, the stamina or chives, the impalement or calyx, and the perianthium, pericarpium, and fruit. See the articles *PISTIL*, *COROLLA*, *STAMINA*, &c.

According to the number of petals or flower-leaves, flowers are called monopetalous or one-leaved, dipetalous or two-leaved, tripetalous or three-leaved, &c. Flowers are again distinguished into male, female, and hermaphrodite: the male flowers are those containing stamina, without any pistil or fruit, commonly called staminate flowers. The female flowers are such as contain the pistil, which is succeeded by fruit; these are called fruitful or knitting flowers. The hermaphrodite are those which contain the organs of both sexes, viz. stamina and pistils, and these are by far the most numerous. From the different figures and disposition of the flower-leaves of plants, Mr. Tournefort has established a system of botany; whereas that of Linnæus is chiefly founded on the number and disposition of the stamina. See *BOTANY*, &c.

Double FLOWERS. This great improvement is to be attempted, in perennials, at the period of forming the bud: and in the same manner all doubling of flowers is first to be undertaken, at the time when those flowers are about to be formed, from which the seed is to be saved for the new progeny.

Every florist knows the advantage of changing seeds with some friend on whose integrity he can rely. When the plants raised from these seeds have obtained about a third part of their bigness, by all possible means promote their free growth, for this is the period at which the buds

buds of flowers take their final form. Clear away the surface of the mould between the plants to an inch depth or more, if that can be done without impairing the roots, and in its place spread some perfectly fresh and rich garden-mould, or some of the compost appropriated to the plant. On this give a gentle watering, which must be repeated afterwards daily in small quantities. Let only a few flowers ripen upon each of these plants; and let not the root exhaust itself by opening more than are intended to be set for seeds; and as the seed which follows the first flowers is the best, let these alone stand for it: if the plant is of the many flowered kind, when as many are opened as are intended to be suffered to remain, let the rest be taken off in the bud. The stalks should be tied up; and the earth cleared to a good distance round these plants, and often broke with a hoe; and watered.

The growth of the seed must be well watched, and let it remain no longer on the plant than till of the full size, and a little hardened; then spread it on a shelf or table in an airy place; and when it is well dried in the pods, separate it, and dry it again loose. Thus hardened, tie it up in bags, and reserve it till the season of sowing. Let there be a large quantity saved in this manner; and if any imperfect seeds appear among them, let them be thrown away.

For the sowing of these seeds chuse a piece of ground in that part of the seminary which is open to the south-east, has a gentle ascent, and through which the air, from the warm quarters, blows freely. Let there be no shade of building, or drip of trees, no large plants near, nor any thing to take the nourishment from the seedlings. Dig out the mould half a spade deep. Bring in some soil from a heap of compost suited to the nature of the plant, and raise a bed of it a full spade depth or something more; and let this be carefully laid in a sloping form; the back or highest part of the bed being to the north-west, and the slope to the exposure. One inch in seven feet is about the proper measure, so that in a bed of twenty-one feet, which is a convenient length, there will be a descent of three inches. The whole piece being thus made into one broad bed, is to be divided into several, by alleys running up the length of it. These should be opened at five feet distance, and be just broad enough to give room for walking up and down, to observe the condition of the plants, and perform the necessary operations.

Upon these beds let the seeds be sown very thinly, and sift a little mould over them: a straw's breadth is in most cases sufficient: but this must be according to the nature of the plants. When the seeds are covered, let a second parcel be scattered upon the surface, and left uncovered: this should be a smaller quantity than the first; and both together should not be more than half as much as what is commonly used for an equal space of ground. On the third day after the seeds are sown give the beds a gentle watering, and let this be repeated every third day, except when showers render it unnecessary; and if violent rains should happen the beds must be defended by a mat hung over them at some distance: this may be done by fastening one end to a strong frame of considerable height at the back of each bed, and drawing the mat to the ground at the foot: supporting it in the midway in three or four places by stakes. Something of this kind must always be in readiness for use: it is never wanted except in case of severe showers, which, if the bed is left exposed to them, whether it is while the seed is shooting, or when the young plants come up, will do them infinite damage, the progress of the growth will be interrupted in them all, and many washed out of the ground; on the contrary, gentle showers will refresh them, and be very beneficial.

When the plants appear, observe if they rise any where so close as to hurt one another. If that be the case they must be thinned, and those which are taken up planted in another bed, away from these. Let no weeds rise near the plants, and be careful that they are watered constantly every afternoon, this must be done with a fine nosed pot which has no cracks or flaws: and the water

should fall from it in the manner of a very gentle shower.

When the young plants have acquired some strength in the seed-bed, let a new set of beds be prepared for them, of twice the bigness of the first. The ground for this purpose must be chosen in a like part of the seminary, but a little more open to the east, and the ground dug away a full spade's depth. Strew some chipings of stone over the bottom, and beat them down flat, but lightly, with the back of a spade. Let the beds be made, with a proper compost, a foot and a half deep; and, instead of a slope, they must be of a rounded form; the best way is to pare away the sides when the bottom is cleared, that the head of the work may be rounding like a gravel walk in a garden; then the chipings of stone are to be spread equally over that surface, and after this the compost is to be spread regularly, and the whole bed made a little rounded on the top. Then divide it by lines lengthways and across, and these, according to the size of the plants, farther asunder or nearer, but they should be at least thirteen inches distant, that there may be room to clear between them. In the spots where the lines cross each other open holes. The most proper time for removing the plants is in the evening of a cloudy day, when the wind is in the south or nearly so, and as all cannot be done in one evening, if the season varies the work must be suspended. In taking up the plants be very careful not to injure their roots. The second beds should be as near as possible to the first, that the fibres may not suffer by the air in carrying from one to the other, and no more of the old mould should be taken up with them, than hangs just about the head of the root. Trim off the extremities of the fibres before the plant is set in its new place; fix it upright, and close the mould carefully round it. When they are planted give them a gentle watering, and let them be open to the night air: but an hour after sun-rise, draw a mat or a canvas at a distance over them, to shade them from the sun; and let this remain, till the time of watering them again in the evening; this care, must be continued till they are perfectly rooted, and after that they are to be left to take their remaining summer's growth without any farther assistance than weeding, breaking the ground carefully at times between them, and watering them according to the weather.

Toward the latter end of September they must have one refreshment; and in the succeeding spring and summer two more. The composts for these services must all be of the same general nature, only made to vary in some degree from one another, and the longer they lie to mellow the better, therefore they may be now prepared in the following manner: Let a quantity of compost be taken from some heap of a proper quality, though different in the ingredients from that used for making the last bed. Divide this into three parcels, and set a stick with a figure on it upright in each, in order to know which is which. With the first parcel mix fine river mud in the proportion of one half, and mark it number *one*. With the second parcel mix one third part of wood-pile earth with the compost, and mark it number *two*. With the third parcel mix it with one fourth part of old cow-dung; work it well together, and mark it number *three*.

This should be done early in the summer, and toward the end of September let the surface of the beds be pared away, or drawn off with a hoe to the depth of one inch, observing to work tenderly just about the stems of the plants. In the place of this bring in as much of the heap numbered *one* as will raise the bed half an inch higher than it was, and after this gather up a small quantity round the stem of each particular plant, which will be thus about two inches deep round the stems of the plants, and an inch and a half every where else. This will by the additional thickness defend the roots against the frost, and serve in the place of a transplantation, by giving a new soil about the upper roots, while the plants are kept from any check by the lower, which remain unremoved.

In the beginning of the spring, when the plants are about to make their first effort, toward the shoot for flowering, take off an inch depth or somewhat more of the whole surface of the bed; and in the same careful manner avoid injuring their roots. This will take off all the compost last laid on, for it will be by this time shrunk within that compass. In the place of this spread on as much from the heap number *two* as will raise the bed half an inch above the former level, and from time to time as the spring advances, water the ground.

Lastly, when the buds for flowering are seen upon the plants, take off the surface once more, and fill up the place of it from the heap number *three*. After this the surface must be broke with a hoe lightly once a week, and every morning the plants must be thoroughly watered, for that is the time when they draw nourishment most briskly, and again in the evening. But in all this watering, regard must be had to the temper of the ground, it must not be over-wetted, but just as much water given as it will receive, retaining the proper condition for the passage, and subsistence of the roots.

In this manner they will be brought to flower under every advantage nature takes in the enlarging and doubling of flowers, but notwithstanding all this care, there will be some single, and some bad amongst them. The latter must be taken up, and the former must have every encouragement given them for the following year.

Let the double flowers be marked for seed, and this method entirely followed in raising the plants, when the second offspring will shew the full success of this practice.

FLOWER GENTLE, *Amaranth*. See **AMARANTH**.

FLOWER of an hour, or Venice Mallow, a species of the *Hibiscus*. See the article **HIBISCUS**.

FLOWER-de-Luce, a species of *Iris*. See **IRIS**.

FLOWER-FENCE. See **BARBADOES FLOWER-FENCE**.

Blood FLOWER. See **AFRICAN TULIP**.

Cuckow FLOWER. See **LADIES SMOCK**.

Eternal FLOWER, or *Austrian Sneefwort*, *Xeranthemum*, a genus of plants ranged by Linnæus among the *syngenesia polygamia superflua*. There are ten species of this genus, of which five only are cultivated in gardens.

1. Eternal Flower with spear-shaped, spreading leaves, commonly called *Ptamica*. 2. Eternal Flower with spear-shaped leaves, and almost naked branches, bearing one flower. 3. Eternal Flower with shrubby, trailing stalks, and downy recurved leaves. 4. Eternal Flower with shrubby trailing stalks, and hairy ciliated leaves. 5. Eternal Flower with branches terminated by one imbricated flower, and obsolete leaves.

The first species is a native of Austria, Italy, and Switzerland, and the rest are shrubby plants, and natives of Africa.

Culture of the Eternal FLOWER.

Of the first species there are two varieties, which are propagated by seeds, sown early, either in spring or autumn, on a border of light earth. When the plants are about two inches high, they should be transplanted into another border, under a warm pale, wall, or hedge, at about four or five inches distance one from another, or into the borders of the flower garden.

The other species do not ripen their seeds in England, and are therefore propagated by cuttings, which if planted on a bed of light earth during any of the summer months, and shaded from the sun will put out roots, after which the plants must be taken up, and planted each into a separate small pot, filled with light earth, and placed in a shady situation till they have taken fresh root, then remove them to a sheltered place, where they may remain till autumn, at which time they should be put under a hot-bed frame, taking care to let them have plenty of fresh air in mild weather. In summer the plants must be placed abroad in a sheltered situation, with other hardy exotics, taking care to water them in dry weather.

Everlasting FLOWER, or **GLOBE AMARANTH**, *Gomphrena*, a genus of plants ranged by Linnæus among

the *pentandria digynia*, and of which there are ten species. 1. Everlasting Flower with an erect stalk, oval spear-shaped leaves, single heads and footstalks, having two leaves. 2. Everlasting Flower with an erect stalk and an uninterrupted spike of flowers. 3. Everlasting Flower with spear-shaped leaves, two leaves to the heads, and each floret with its proper cup. 4. Everlasting Flower with obtuse, fleshy leaves, and oblong heads, terminating the stalks. 5. Everlasting Flower with a climbing stalk, oval spear-shaped leaves, very long naked footstalks, and an uninterrupted spike. 6. Everlasting Flower with an erect stalk, spear-shaped leaves, and heads on the sides of the stalks, fitting close. 7. Everlasting Flower with a creeping stalk, round heads, fitting close to the stalks, and oval spear-shaped leaves. 8. Everlasting Flower with a creeping stalk, divided by pairs, hairy spear shaped leaves and heads of flowers, fitting close to the sides of the stalks. 9. Everlasting Flower with a trailing stalk, the under leaves spear-shaped, the upper round, and loose heads terminating the stalks. 10. Everlasting Flower, with bifid, opposite foot-stalks, having three heads, the middle one sitting close to the stalk.

The first species is a native of the Indies, and an annual plant: there are two varieties of it: one with a large head of flowers, of a fine bright purple, the other with a head of a white or silver colour; these are the two sorts commonly cultivated: for the other species being plants of no great beauty, are preserved only in botanic gardens for the sake of variety.

Culture of the Everlasting-FLOWER.

These varieties are propagated by seeds, which should be sown on a hot-bed in the beginning of March; when the plants are come up about half an inch high, they should be transplanted on a fresh hot bed, at about four inches distance, observing to shade them till they have taken root: then they should have fresh air admitted to them every day, in proportion to the warmth of the season, and let them be gently refreshed with water.

In about a month's time a fresh hot-bed must be prepared, into which a sufficient number of pots must be plunged, filled with light rich earth; and when the bed is in a proper temperature of heat, let the plants be carefully taken up, with balls of earth to their roots, and each planted into one of these pots, observing to shade them till they have taken fresh root, and afterwards they may be treated as other tender exotic plants.

When the plants have filled these pots with their roots, they should be taken out, and the roots on the outside of the ball of earth, carefully pared off; then they should be put into pots of a larger size. In July the plants should be gradually inured to the open air, into which they may be removed about the middle of the month, and intermixed with other annual plants, to adorn the pleasure garden, where they will flower from the latter end of September, till the frosts nip them; and being gathered in their prime, they will retain their beauty a long time, and serve in lieu of artificial flowers, for ornament.

Four-o'clock-FLOWER. See **MARVEL OF PERU**.

Fennel FLOWER, or **DEVIL-IN-A-BUSH**. See the article **DEVIL-IN-A-BUSH**.

Globe-FLOWER. See **Globe-RANUNCULUS**.

Honey-FLOWER, *Melanthus*, a genus of plants, ranged by Linnæus among the *didynamia polypetala*, and of which there are only two species. 1. Honey-Flower, with single stipulæ, growing close to the foot-stalk. 2. Honey-Flower, with two distinct stipulæ.

These plants grow naturally at the Cape of Good Hope. The first sort has a perennial root, which spreads much in light ground, from which arise many hollow soft stalks, six or seven feet high, decorated with large winged leaves.

The flowers are produced in long spikes, which arise from the top of the stalks, and are of a chocolate colour.

The second sort rises with round, soft, ligneous stalks, five or six feet high, which send out two or three branches from their sides. The leaves are like those of the former sort: their colour is a deep green on the upper side, and whitish underneath; the flowers come out from

the sides of the stalks in loose hanging bunches, each sustaining six or eight flowers, which are smaller than those of the first sort; the lower part of the petals are green: the upper part of a saffron colour; and on the outside, in the swelling part of the petals, is a blush of fine red.

Culture of the Honey-Flower.

The first species is propagated by taking off its suckers or side-shoots, at any time from March to September, and planting them in a dry soil and a warm situation. It may also be propagated by planting cuttings during any of the summer months, which if watered and shaded, will take root very well, and may afterwards be transplanted where they are designed to remain.

These plants should be covered with mats or reeds in frosty weather, to prevent their tops being killed by the cold.

Pasque-Flower, *Pulsatilla*, a genus of plants, ranged by Linnæus among the *polyandria polygynia*, and of which there are four species. 1. *Pasque-Flower*, with decomposed winged leaves, and a nodding flower, having an erect rim. 2. *Pasque-Flower*, with decomposed winged leaves, and a pendulous flower, whose border is reflexed. 3. *Pasque-Flower*, with simple winged leaves, whose wings have lobes, and an erect flower. 4. *Pasque-Flower*, with hand-shaped leaves, having many points, and an erect spreading flower.

The first of these plants is common in divers parts of England, especially on Gogmagog hills near Cambridge, where it covers whole spots of ground.

The root is long and thick, black on the surface, split into many heads, and tufted on the crown of each; bitter to the taste and acrid. The leaves are of a pale hoary green, and are supported on long weak foot-stalks, naturally of a deep red toward the ground, and paler upwards; each leaf is divided and subdivided in the pinnated manner: and the segments are small and narrow. The flower-stalks rise among these, two or more from every head of the root: so that when the plant is carefully managed, it is not uncommon to see a cluster of eight or ten bursting out in their full glory together; there are no leaves upon this stalk, except the involucre of the flower placed upon its top can be called by that name; its colour is purple at the base, of a whitish green upwards, and it is hollow, light, and hairy; this shields the base of the flower, which rises in its hollow bosom from the summit of the stalk; its size is equal to that of the larger Single Anemonies, its colour a most elegant violet purple, shining with a peculiar smoothness and delicacy on the inside, while the whole outer part or bark, is hairy.

The second species grows naturally in the meadows in Germany: it has shorter leaves than the first; the stalks do not rise so high, nor the flowers expand so wide; their colour is a deep purple.

The third species grows naturally on the Alps and Helvetian mountains, and has a perennial root. The leaves are simply winged; the stalk rises near a foot high, is naked almost to the top, where comes out a neat hairy involucre, and above that one yellow flower.

The fourth species is a native of Siberia; it has a thick fleshy root, which sends out many strong fibres. The leaves are hand-shaped, downy, and cut into several segments. The stalk rises nine or ten inches high, having a hairy involucre a considerable distance below the flower; it is terminated by one flower, which is large, spreading, and of a whitish yellow.

Culture of the Pasque-Flower.

These plants may be propagated by seeds, which should be sown in boxes or pots filled with very light sandy earth, observing not to cover the seeds too deep with mould, which will prevent their rising: for they require no more than just to be covered; these boxes should be placed where they may have the morning sun till ten o'clock, but must be screened from it in the heat of the day: and if the season proves dry, the earth should be often refreshed with water. The best time for sowing these seeds is in July, soon after they are ripe; for if they are kept till spring, they seldom grow.

The boxes or pots, in which the seeds are sown, should remain in this shady situation till the beginning of October, when they should be moved where they may enjoy the full sun during the winter season. About the beginning of March the plants will appear, at which time the boxes should be again removed, where they may have only the forenoon sun; for if they are too much exposed to the heat, the young plants will die; they should also be refreshed with water in dry weather, which will greatly promote their growth; great care must be taken to keep them clean from weeds, which if suffered to grow, would in a short time destroy the plants.

When the leaves of these plants are entirely decayed, which is commonly in July, the roots should be taken up, which being nearly of the colour of the ground, will be difficult to find while small; therefore the earth should be passed through a fine wire sieve; but notwithstanding all possible care taken, there will be many small roots left, so that the earth should either be put into the boxes again, or spread upon a bed of light earth, to see what plants will arise out of it the succeeding year.

The roots which are taken up should be immediately planted again in beds of fresh loamy earth, about three or four inches asunder, covering them about three inches with the same earth. The spring following most of these plants will produce flowers, which will increase in size as the roots grow larger; these plants thrive best in a loamy soil: for in very light dry ground they are apt to decay in summer.

Satin Flower, *MOONWORT*, or *HONESTY*, *Lunaria*, a genus of plants, ranged by Linnæus among the *tetradynamia filiculosa*, and of which there are two species. 1. *Satin Flower*, with oblong pods, commonly called *Honesty*, or *White Satin*. 2. *Satin Flower*, with roundish pods.

The first species is a native of the northern parts of Europe, and is a perennial plant; and the second sort grows naturally in Germany.

Culture of the Satin Flower.

Both these species are propagated by seeds, which should be sown in the autumn. The plants will grow in almost any soil, but succeed best in a shady situation, and require no other culture but to be kept clear from weeds. If the seeds are permitted to scatter, the plants will rise without any further care.

Star Flower, or *STAR* or *BETHLEHEM*, *Ornithogalum*, a genus of plants, ranged by Linnæus among the *hexandria monogynia*, and of which there are thirteen species. 1. *Star-Flower*, with a very long spike of flowers, spear-shaped filaments, and foot-stalks to the flowers, equal and spreading, and those of the fruit approaching to the stalk; or *Star-Flower*, with whitish green flowers. 2. *Star-Flower*, with a conical spike, having numerous flowers rising above each other. 3. *Star-Flower*, with the longest spike, and spear-shaped leaves. 4. *Star-Flower*, with a very long spike, the foot-stalks of the flowers alternately shorter, and the outer petals narrow. 5. *Star-Flower*, with fruitful hanging flowers, and a bell-shaped nectarium. 6. *Star-Flower*, with spreading alternate petals, and the lower ones erect. 7. *Star-Flower*, with an angular stalk, having two leaves, and single umbellated foot-stalks; *Yellow Star-Flower*. 8. *Star-Flower*, with an angular stalk, bearing two leaves, and branching foot-stalks, having umbels. 9. *Star-Flower*, with flowers growing in a corymbus, whose foot-stalks are taller than the stalks, and indented filaments. 10. *Star-Flower*, with flowers growing in a corymbus, foot-stalks lower than the stalk, and indented filaments. 11. *Star-Flower*, with a loose conical spike of flowers, very long foot-stalks, and flowers standing erect. 12. *Star-Flower*, with oval heart-shaped leaves. 13. *Star-Flower*, with a very long spike, and taper fistular leaves.

The first sort grows naturally in several parts of England; this hath a pretty large bulbous root, from which come out several long keel-shaped leaves, which spread on the ground; between these comes out a single naked stalk, about two feet long, sustaining a long loose spike of flowers, of a yellowish green colour, standing upon

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upon pretty long foot-stalks, which spread wide from the principal stalk; the petals of the flowers are narrow, making but little appearance. The flowers have an agreeable scent: they appear in May; and when the seed-vessels are formed, the foot-stalk which sustain them become erect, and approach near the stalk. The seeds ripen in August.

The second sort grows naturally upon the hills in Portugal and Spain, but has been long cultivated in the English gardens, by the title of *Star Bethlehem*; this hath a very long oval, bulbous root, from which arise several long keel-shaped leaves of a dark green colour, and in the middle comes out a naked stalk, which rises near three feet high, terminated by a long conical spike of white flowers, standing upon pretty long foot-stalks, which rise one above another, inclining to an upright; these appear in June, and are succeeded by roundish seed-vessels, having three cells filled with roundish seeds, which ripen in August.

The third sort grows naturally in Arabia; this hath a very large bulbous root, from which come out several broad keel-shaped leaves; the stalk is thick and strong, rising between two and three feet high, bearing a long spike of large-white flowers, standing upon long foot-stalks; they are composed of six petals, which spread open in form of a star, and appear in June, but do not ripen their seeds in England.

The fourth sort grows naturally in the Levant; this hath a pretty large bulbous root, from which arise five or six long narrow leaves; the stalk rises about a foot and a half high, and is terminated by a long loose spike of white flowers, composed of six petals; the inner ones are broad, and the outer, which stand alternate, are narrow; it flowers in June, but does not perfect seeds here.

The fifth sort grows in great abundance naturally in the kingdom of Naples, and is now become almost as common in England; for the roots propagate so fast by off-sets and seeds, as to become troublesome weeds in gardens.

The sixth sort grows naturally in Africa: it has a bulbous root much smaller than either of the former; the leaves are long, narrow, keel-shaped, and flaccid; the stalks rise about a foot high: they are slender, and sustain six or seven flowers, hanging on long slender foot-stalks, placed at a distance from each other; this flowers in July, but does not produce seeds here.

The seventh sort grows naturally in Yorkshire, and some of the other northern counties in England; this has a large bulbous root, from which come out four or five keel-shaped leaves, about five inches long, and in the middle rises an angular stalk, having two narrow leaves, which grow about six inches high, sustaining at the top six or eight yellow flowers in form of an umbel, standing upon long slender foot-stalks; these appear in April, and are succeeded by triangular capsules, having three cells, which are filled with roundish seeds.

The eighth sort has small bulbous roots, not larger than peas, from which arise one or two narrow keel-shaped leaves, about five inches long, of a greyish colour; the stalk is angular, and rises about four inches high, having two narrow keel-shaped leaves just below the flowers, which are disposed in an umbel upon branching foot-stalks; these are yellow within, but of a purplish green on their outside; they appear in May, and are succeeded by small triangular capsules, filled with reddish uneven seeds; it grows on the borders of cultivated fields in France and Germany.

The ninth sort grows naturally in most parts of Europe, and is supposed to do so in England, though it is seldom found here, unless in orchards or grounds where the roots may have been planted; this has a bulb as large as a small Onion, to which adhere many small off-sets; the leaves are long, narrow, and keel-shaped, spreading on the ground, and have a longitudinal white line through the hollow. The stalk rises about six inches high, sustaining an umbel of flowers, which are white within, but have broad green stripes on the outside of the petals; these stand upon long foot-stalks, which rise

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above the principal stalk; it flowers in April and May, and is succeeded by roundish three-cornered capsules, filled with angular seeds, which ripen in July.

The tenth sort grows naturally in Arabia; this has a large bulbous root, from which rise many long keel-shaped leaves, which embrace each other with their base: they are of a deep green, and stand erect; this has not been known to have flowered in England; the roots multiply exceedingly, and are never injured by frost, although the leaves are put out before winter.

The eleventh sort grows naturally at the Cape of Good Hope; it has a round bulbous root, covered with a white skin, from which come out four or five keeled-shaped leaves, embracing each other at their base; they are of a deep green, eight or nine inches long: in the middle of these arises the stalk, which is naked and about a foot high, just under; the flowers come out two or three short leaves, which end in acute points.

The flowers stand upon very long foot-stalks, they are formed in a conical spike, and are composed of six oval petals of a pure white: within these are situated six stamina, which are about half the length of the petals, terminated by roundish summits. The flowers are in beauty in May, and are succeeded by roundish three-cornered capsules, with three cells filled with roundish seeds, which some years ripen here in July.

The twelfth sort grows naturally at the Cape of Good Hope; this hath an irregular tuberous root, varying greatly in form and size, covered with a dark brown bark, from which arise several oval heart-shaped leaves, upon pretty long foot-stalks: they have several longitudinal veins, like *Ribwort Plantain*; the flower-stalks are slender, naked, and rise about a foot high, sustaining several small, greenish, white flowers, found in a loose spike, standing upon long slender foot-stalks; they come out in November, making but little appearance, and are not succeeded by seeds in England.

The thirteenth sort grows naturally on the dry rocks at the Cape of Good Hope; this hath a large, depressed, bulbous root, as big as a man's fist, covered with an uneven brown skin, putting out several taper hollow leaves, nine or ten inches long, between which comes forth a naked stalk near a foot high, terminated by a loose spike of yellow flowers, of an agreeable scent; it flowers in May, but does not produce seeds in England.

Culture of the Star-Flower.

The four sorts first mentioned are cultivated for ornament in the English gardens; the roots will live in the common borders, and produce their leaves, and multiply by off-sets, but very rarely flower. 'Tis not a wonder that a native of a climate so different from, and so much warmer than our own, should not readily flower with us in this rude way of culture; but there is so much beauty in the plant, that it should be allowed all advantages.

The roots are brought over annually by the Italians, and they should be treated as others from such climates; when they are received they should be cleaned, the dead skins pulled off, the decayed parts cleared away, and the roots wiped softly with a cloth; after this let them be laid in a cool place in the open air three days, and then planted in the following manner: let some fresh black mould, from under the turf in a meadow, be mixed with equal parts of rotted cow-dung and pond-mud; let some loose pieces of gravel be laid in the bottom of a pot, and this compost poured in to fill it half up; let the root be set upright upon this, and more of the mould poured in till it is covered half an inch; refresh and settle the mould by a very gentle watering, and then set the pot in a warm shaded place.

Once in four days give a very little water; it is necessary to do this, but nothing requires so much caution; if the mould be suffered to become too dry, the root will not shoot its fibres: if it be made too wet it will rot; the caution of the gravel at the bottom of the pot was directed to preserve the free passage of the water; and the way to know whether the temper of the mould be right, is to open it a little way at the edge of the pot to examine it.

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If this practice be followed during the beginning of summer, there will be shoots seen toward the middle of July; these must be encouraged by more watering: and when the evenings begin to be cool, the plants must be removed into a warmer and opener place, but still sheltered from cold winds. It will be best to set it among the green-house kinds.

Toward the end of September let it be removed into the stove, and set in the bark-bed; it must be watered at times, and treated as the rest, and it will flower in its full beauty.

After this, every spring and autumn the mould must be taken off from the surface, and fresh put in the places; and once in two years the root must be taken up, the off-sets cleared away, and planted in separate pots, and the old roots in fresh quantities of the same mould, as at first: then the plant will flower in all its perfection; and this is its natural treatment.

The fifth sort is scarce worthy a place in gardens: but as it will thrive in any situation, or under trees, so a few plants may be admitted for the sake of variety.

The sixth sort has not much beauty, therefore a few roots of it will be enough for variety, as also of the seventh and eighth sorts; the two last will thrive in shade, but the sixth should have an open situation.

The ninth and tenth sorts multiply so fast by off-sets from the roots, as to become troublesome weeds in gardens; for every small root will grow, and in two years produce twenty or thirty more: so that unless the larger roots are taken up every year, and divested of their off-sets, the borders will be over-run with them.

The eleventh sort is too tender to thrive in the open air in England, so the roots of this should be planted in pots filled with light earth, and in the autumn placed under a hot-bed frame, where they may be secured from frost, and in mild weather enjoy the free air; the leaves of this appear in the autumn, and continue growing all the winter, so must not be exposed to frost, nor should be drawn up weak, for then the flowers will be few on a stalk and not large.

If the pots do now and then receive a gentle shower of rain in winter, it will be sufficient, for they should not have much wet during that season; toward the beginning of July the leaves and stalks decay, and then the roots may be taken up, laying them in a dry cool place till the end of August, when they must be planted again.

The twelfth and thirteenth sorts were formerly more common in the English gardens than at present; these kinds are more tender than any of the former, so should be planted in pots filled with fresh light earth, and in winter must be placed in an airy glass-case amongst Sedums, Ficoidefes, and such other pretty hardy succulent plants, which require a large share of air in mild weather, and but little wet. In summer they may be removed out of the house, and placed in a warm-sheltered situation, observing never to give these plants much water when they are not in a growing state, lest it rot their roots: but when they are growing freely, they must be frequently but gently refreshed with water; these roots should be transplanted every year; the best time to perform this work is soon after the flower-stems are decayed, when the roots will be in the most inactive state; when this is done, the off-sets should be carefully taken off, and each transplanted into a small pot, filled with light fresh earth, and may be treated as the old roots.

Sun-FLLOWER. See *SUN-FLLOWER*.

Trumpet-FLLOWER, Bignonia. See the article *BIGNONIA*.

Wind-FLLOWER, Anemone. See *ANEMONE*.

FLUELLIN, a species of Speedwell. See the article *SPEEDWELL*.

FLYWORT, a species of Lychnis. See *LYCHNIS*.

FOOT-STALKS, among botanists, the small stalks which immediately sustain the leaves, flowers, or fruit of a plant.

FORCING-FRAME, a contrivance for bringing the common fruits more speedily to perfection.

The trees must all have the advantage of a wall, and their blossoming is to be brought forward by artificial heat:

the most familiar way is by means of dung: it requires a large quantity of that manure, and the assistance must be at times renewed; but dung which has lost its heat, is not deprived of its virtue; the dung which has been used for these will answer other purposes, and the real expence is less than imagined. As the dung is to be laid behind, there must be a glass work in front of the wall, and on the due management of these depends the whole business.

Three years are required to re-establish those trees in strength, which have been forced by these means; therefore whatever be the quantity the gardener intends to force each year, four times so many trees, and the due extent of wall for them is to be allowed for the whole; he must chuse a part of the ground which has the full south sun, and is well defended from all the cold quarters. Here a wall must be built eleven feet in height, and the south surface covered with good plaister, laid on smooth and white-washed; four feet and a half from the bottom of the wall let there be drawn a line, as a mark for the border: let this be well dug up, and if not naturally a good soil, it must be improved by art; a ledge of firm oak board must be laid along the line, or outer edge of the border, which must be thick enough to admit a groove, in which the wood-work of the frame of some glass lights may move; let as many of these glass lights be made as will cover one fourth part of the wall, that being the quantity to be used at once: and let these be well framed; the breadth of each may be at the pleasure of the gardener for convenience of moving, but their height must be such as will reach from the ledge of oak in front of the border, to the top of the wall. At the top there must be another frame-work of firm wood, for receiving the upper edge of the lights, and this may project five inches from the surface of the wall; the work must be all extremely close, and there must be at due distances ribs of wood slanting from the top of the wall to the frame, to support the lights from bending inwards; this being done, the whole is in readiness for service; the two ends must be closed in such manner as to admit a door in each, and this must be made firm, strong, and to shut close.

The trees being thus defended before, are to be forced to blossom and fruit at an early season, by the heat of the dung behind; the first time of applying this must be the third week in November, and from that period to their ripening, the heat must be kept up constantly by fresh quantities of dung. The common horse-dung, with the litter among it, is to be used for this purpose; and the preparation it requires, is only to be thrown up in a heap for five days before, that the fermentation may be equal in every part.

The gardener must draw a line along the ground behind the wall; that is, on its north-side, at five feet distance from its base. The dung is to extend as far as this, from the wall at the bottom, and is to be carried up gradually sloping to the top, but it is to be there eight and twenty inches thick. About five weeks after this, let a fresh parcel of dung be got ready, laying it in a heap as the first; and when it has lain the due time to heat equally, let the old dung be removed from the wall, and this put in its place, piling it up as the other, just to the top of the wall, for the nature of it is to shrink down; this is to be repeated when there is occasion, and this is all that is required in the construction of the frame.

FOUNTAIN, or *Artificial-FOUNTAIN*, a contrivance by which water is violently spouted upwards. Fountains, the theory of which does not belong to a work of this kind, are not only great ornaments to a fine garden, but also of much use; they should be so distributed, that they may be seen almost all at the same time, and that the water-spouts may range all in a line one with another.

FOX-GLOVE, *Digitalis*, a genus of plants, ranged by Linnæus among the *didynamia angiospermia*, and of which there are four species. 1. Shrubby Fox-glove, with the little leaves at the cup lanceolated, and with the flowers bilabiated and acute, or Golden Fox-glove. 2. Fox-glove, with the leaves of the cup oval and obtuse,

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obtuse, and with the lower lip of the length of the flower; or Ferrugineous Fox-glove. 3. Fox-glove, with the small leaves of the cup oval and acute, the petals obtuse, and the upper lip entire; or the common Fox-glove. 4. Fox-glove, with the small leaves of the cup spear-shaped, and the petals acute, with the upper lip bifid; or the lesser Spanish Purple Fox-glove.

The Golden Fox-glove rises two feet high, the root is brown, divided and spreading, and the main stem is purplish; this is of a woody hardness, and with good culture sends out several branches. They have a red bark, but obscured by a white cottony matter, that hangs loosely over them.

The leaves are numerous, and have no foot-stalks; they are long, sharp-pointed, serrated, and of a fresh green colour, which a light hairyness renders greyish and silvery. The flowers are large, and placed in long and crowded spikes: they are so divided as to mimic the labiated form, and their colour is a bright and pure gold yellow.

It is a native of the Canary Islands, where it grows in rotten soils that have some shelter; it there flowers all the year, and with good management will do nearly the same with us.

Most flowers contain in their base a honey juice, but this shews something of that kind more distinguishably than almost any other. Where it is a native, there continually stands in the center of each flower a large drop of a clear clammy liquor, of an extremely bitter taste; with us the drop is smaller, but it has the same bitterness, and when at its full bigness it will drop from the flower. The whole plant is also bitter.

Culture of the Golden FOXGLOVE.

This plant is to be raised from seeds; and those ripened in Europe will produce it: but as on all other occasions, when there is opportunity of having them from the natural place of growth it is better. They must be sown early in spring upon a moderate hot-bed, and raised by the common culture given to plants so propagated, all that is particular is the soil. When they have acquired some strength in the seed hot-bed, they must be planted out into pots, and these set in another hot-bed, that they may the more freely root, and send up new shoots from the sides of the original stem, for if that be prevented by a careless management, they will sometimes run up with a single stalk, and lose much of their beauty. They must in this new hot-bed be sheltered from the sun, till they have taken root, then exposed by degrees to the air; and at last having been removed into larger pots, they are to be set among the green-house plants in summer and housed with them in winter.

The most proper soil for them is made of equal quantities of garden-mould, wood-earth, and pond or river mud. In this compost, with frequent and moderate waterings, they will flower as in their natural climate, from June till October, or later.

Ferrugineous FOXGLOVE. This is a singular plant, colour is greatly against it, but the upright robustness of the stem, the height of the plant, its clustered leaves, and above all its long spike of thickset flowers, demand our attention.

The root is a thick head, with innumerable long fibres. The stalk is five feet high, rounded, but lightly ridged, and of a dusky green. The leaves are long, narrow, somewhat hollowed, and extremely numerous: they are placed very close, but irregularly on the stalks; and their colour is a dull green. The flowers are placed as thick as they can stand, in a spike of near a yard in length, and they gape open. Their colour is that of rusty iron, a yellowish or reddish brown, and they are of considerable duration.

Culture of this FOXGLOVE.

It is a native of the warmer parts of Europe, and the east; but lives very well throughout the year in our gardens, if a warm part of the nursery is chosen for its propagation; and a sheltered part of the garden for it to flower.

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Let the seeds be saved from a robust and large plant, and when they have been carefully dried, and hardened upon a papered shelf, let them be put up in bags in small quantities, and hung up for the winter. In the March following let a bed be dug up in a warm part of the nursery, and the seeds scattered on with an even hand; not too thick. The common mould of the seminary will answer for this purpose, for they will rot in too rich a soil. When the plants come up let them be thinned, and the bed carefully weeded, and at times refreshed with a little water. When the plants are four inches high, let a new bed be dug up for them in a near part of the nursery; and in the evening of a cloudy day, let them be taken up and planted in this at seven inches distance, taking care to keep a good quantity of their original mould about their roots. Particular regard must be had to the preserving the upright straightness of the stalk; because on that a great part of the beauty of the plant will depend.

Let them be watered in their new bed as soon as planted, and shaded by a reed-hedge or mat, till they have taken root; after which let the bed be constantly and carefully weeded, and the plants kept in a state of free growth by frequent but moderate waterings. In autumn let them be removed into the places where they are to flower. The best compost for this purpose is a mixture of equal parts of garden-mould and dry pasture earth. Open holes in this, and set the plants upright in it with a good ball of their own earth; and tie them up to short firm stakes to secure their upright growth.

They will thus flower very boldly, and the fruit of them should be permitted to ripen seeds. It is with these as with many other of the hardy fibrose rooted European kinds, they may be made either biennial or perennial at the pleasure of the gardener.

If they be suffered to stand and ripen the vast quantity of seed which naturally follows that great number of flowers, the root becomes quite exhausted, and the plant dies; but if the stalk be cut down before the flowers fade, the root will continue strong for several years. Therefore let the gardener save some seed from one plant every year, and let that be the tallest and stoutest of all; and let him cut down the others as soon as they are past their beauty. From the seeds thus saved from the best plants, and sowed every year, he will have an improved kind; and from the others, whose stalks he cut down, a large increase by parted roots.

The same method of culture is proper for the third and fourth species of this genus.

Hot-bed FRAME. See HOT-BEDS.

FRAXINELLA, or White DITTANY, *Diſtamus*, a genus of plants ranged by Linnæus among the *dicandria monogynia*, and of which there is only one known species.

There are three varieties of this plant, one with a pale red flower striped with purple, another with a white flower, and one with shorter spikes of flowers.

This is a very ornamental plant for gardens, and as it requires very little culture, deserves a place in all good ones. It has a perennial root, which strikes deep into the ground; the head annually increases in size; it sends up many stalks in proportion to its bigness, which rise from two to three feet high, decorated with winged leaves placed alternate. The flowers are produced in a long, pyramidical, loose spike, or thyrse, on the top of the stalk, nine or ten inches long. The whole plant when gently rubbed, emits an odour like that of Lemon peel, but when bruised has something of a balsamic scent.

Culture of the FRAXINELLA.

It is propagated by seeds, which should be sown in autumn, soon after they are ripe. In April following the plants will come up, they should be constantly kept clean from weeds; and in the autumn when their leaves decay, the roots should be carefully taken up, and planted in beds at the distance of six inches. These beds should be four feet broad, and the paths between them two. In these beds the plants may stand two

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years, during which time they must be kept clear from weeds.

In the autumn they should be carefully taken up, and planted in the middle of the borders of the flower-garden, where they will continue thirty or forty years, producing more stems of flowers in proportion to the size of the roots. They should be kept clean from weeds, and the ground about them dug every winter.

FRIER'S COWL, a species of the Arum. See the article ARUM.

FRINGE-TREE. See SNOWDROP-TREE.

FRITILLARY, *Fritillaria*, a genus of plants ranged by Linnaeus among the *hexandria monogynia*, and of which there are five species. 1. Fritillary with all the leaves alternate. 2. Fritillary with a tufted branch, naked below, and with entire leaves; or the Crown Imperial. 3. Fritillary with a tufted branch, naked below, and variegated leaves. 4. Fritillary with a naked branch and oblique leaves; or the Persian Lily. 5. Fritillary with the lower leaves opposite.

The first species is an old inhabitant of our gardens, pleasing by its peculiarity, and for being raised with little trouble. The root is bulbous, firm, and composed of two unequal parts. From the middle rises a kind of pillow, and from this the stalk, whose base is hung with many fibres. The substance of the root is uniform, soft, and white, and it is neither coated nor covered with films. The stalk is round, upright, not very thick or strong, but ten inches high; spongy within, and covered with a tough green rind, tinged often with brown and purple.

The leaves are placed from top to bottom with a beautiful irregularity, five or six, sometimes more, grow on a stalk, and often less. They are long, narrow, of a deep green, hollowed, sharp-pointed, and of an acid taste. From the top hangs one large flower: culture gives many, but the plant is treated of here as in the state of nature, or little removed from it in common gardens. This bends its weak stalk, and the mouth opens to the ground. It is large and extremely elegant, as well as singular. It rises naked from the stalk, without cup or any other defence. It is in shape like a bell, wide at the base, and formed of six petals, which stand parallel, and are pointed at the ends. Near the base of each of these is an oblong hollow, containing a drop of honey juice. The colouring of the flower even in its wild state is not without its changes: and it is in all beautiful. The general tinge is purple, chequered with various degrees of red and white. The variegations are not disposed at random as in the generality of painted flowers, but placed in regular little squares; they are more distinct on the outside of the petals, for within the flower glows with a more uniform purple down the middle of each: on the outside there also usually runs a rib of yellowish hue, adding no little grace. This is the appearance nature gives the flowers in the most favourable soils; but from a variety of accidents it often declines from this its natural lustre. The purple grows faint, the yellow greenish, and the variegations fade one into another. But there always remains a great deal of beauty.

In poor soils the plant will be small and the flowers nearly or entirely white.

Purple Pyrenean FRITILLARY, a short description will serve to explain this plant, whose general form and characters are the same with those of the preceding kind, its most obvious difference, is in the size and colour of the flower.

The root is a double bulb, soft, fleshy, and naked. In the wild state it is small, but in gardens it often exceeds that of the other. The stalk is slender, upright, green, and beset with many plants. These are long, narrow, sharp-pointed, flattened, and of a fresh green. They stand irregularly on the upper part of the stalk, but on the lower part in pairs. One flower as in the other hangs naturally from the top of the stalk; and it is bell-shaped as in that, and formed of six petals; these turn their edges a little upward, and are variously stained

with yellow; the ground colour is a dusky tinge, and there is occasionally more or less of the yellow. The edges that turn up shew a yellowish hue: this with more or less mixture of green is the colour of the whole inner surface; the flower is there more glossy than without; and the whole is marked with irregularly chequered purplish spots. These are more distinct toward the lower part of the petals.

Culture of these FRITILLARIES.

These two kinds are natives of many parts of Europe, and love a rich and somewhat moist soil, where they have a little shelter. The foot of a hill near which there runs some little stream, and a wood defends the spot from the north, affords them their full natural perfection.

From plants which grow in such soil and situation should be selected seeds for raising them under yet more favourable circumstances in gardens; and from these will be produced the several elegant kinds which follow. The strongest of these plants, or of the same kinds in gardens, should be marked while in flower, and the seed-vessels cut off when they are ripe; this will be in the latter end of July. Let them be laid on a shelf three weeks to harden: then let the seeds be taken out, and spread for a week more; and at the end of this time which will be the latter part of August, let them be sown upon a piece of good ground in the nursery, open to the morning sun, but defended south and north. Here let them be allowed the common management; weeded from time to time, thinned where they have risen too close, and watered often a little at a time.

In the beginning of the following autumn take up all the roots: plant them at three inches distance on a fresh bed, in a like situation, and allow them the same care. They may remain in this bed till the time of their flowering; which according to the management, or other accidents, will be the third or fourth year. Then the best plants must be marked; and in autumn their roots taken up, and planted in another bed at five inches distance.

There will be thus produced many very handsome flowers; and from these will be raised with ease the following elegant varieties.

Isabella FRITILLARY. This is a very beautiful variety, produced from the common purple kind, and less distinct in the appearance than many of the succeeding. The difference principally consists in the firmness of the stalk and colouring of the flower. The root is white and fleshy. The stalk is round, and toward the bottom purplish. The leaves are very narrow, few in number, placed irregularly, and of a pale green. One flower bends the top of the stalk, and this does not exceed the common kind in bigness, but greatly excels it in the colouring. The base is wider and more rounded. The petals are broader in proportion to their length than in that flower, and no part of the edge turns up.

Two colours diversify the whole; these are an elegant light red, and a clear green. They are disposed in large square pots interchangeably, and the edges of these figures are very distinct. The colours are brighter toward the ends of the petals, and more obscure nearer the base. The great merit of this flower is the brightness of the red and the distinctness of the spots.

It is sometimes produced from a first sowing, but in greater perfection from the sowing again the best kinds raised, as has been already directed, from wild seeds.

Great Umbelliferous FRITILLARY. This stands distinguished eminently from all the other kinds by the strength and stateliness of the stalk, the breadth and firmness of the leaves, and the size and number of the flowers.

The root is large and white. The stalk rises to the height of eighteen inches, and is purplish at the base, green upwards, and of a firm substance. The leaves are considerably broad, long, sharp-pointed, often twisted, and of a deep green. At the top of the stalk there are three or sometimes more flowers; very large and conspicuous also by the boldness of their colouring. They do not

not regularly hang down as in the other kinds, but some droop more than others, and sometimes one or more are nearly horizontal. The base is swelling and round; the petals are broad and sharp-pointed and the flower opens regularly without any turning up of the edges. The colours are very fine, a deep lively purple, and a very agreeable greyish brown. This latter is the ground colour, and the chequerings are of the purple; the whole flower is of a glossy polished surface, and has some lines of a yellowish green within. It rises from the seeds of the common purple kind, but rarely perfects any itself. Therefore when the gardener has obtained a plant of it, he must increase his store by off-sets.

Small umbelliferous FRITILLARY. This is a very singular and elegant variety. The root is small and whitish. The stalk is firm, green, and eight inches in height: culture rarely makes any considerable alteration in this article, though it covers the whole length with leaves, and crowns its top with numerous flowers. The leaves are long, moderately broad, and of a fresh and lively green: they are hollowed, often waved or twisted, and they stand irregularly, except at the bottom, where they commonly are found in pairs. At the top of the stalk are placed four, five, or six flowers in an elegant cluster. Each has its separate slender footstalk, and they all droop as in the other kinds. The points of many leaves rise above them, and give the whole somewhat of the appearance of the Crown Imperial. See the article CROWN IMPERIAL.

The flowers are small, hollow, angulated at the base, and turned up a little at the edges of the petals. The colour is a deep dusky purple, with variegations of yellowish green. On the outside the colours are less distinct; on the inner part they are much more regularly disposed; and the whole inside is of a polished surface. This is produced from the seeds of the Pyrenean kind; but like the last described, it must, when once obtained, be propagated farther by roots, for it scarce ever ripens any seeds itself.

Yellow Italian FRITILLARY. This is a variety from the seed of the common purple kind, but it differs greatly and elegantly from it in the colouring of the flower, and even in the general conformation of the plant.

The root is large and whitish. The stalk is round, fleshy, and firm, but rarely exceeds eight inches in height. The leaves are remarkably broad, less hollowed than in the other kinds, and obtuse at the end. From the top of the stalk hangs one flower. It is very large, and particularly beautiful; round at the base, regularly open at the mouth, and chequered all over with perfect regularity. The ground colour is a very fine yellow: the spots of a deep crimson, inclining a little to purple; and the outside and inner have both a glossy surface. This ripens seeds in great perfection, and they should be saved with care.

Green FRITILLARY. It is a perennial variation of the Pyrenean kind; and, if less worthy to be cultivated than some others for its beauty, it has a singularity that will very well supply the place. The root is large, and in favourable soils will swell to a very large size. The stalk is round, upright, green, and spotted with purple and brown; the leaves are moderately broad, and of a fine fresh green. The flowers hang from the top of the stalk, often two, rarely more; sometimes only one; and though each, when there are more, has naturally its footstalk separate, the two will sometimes unite into a broad, flat, common pedicle, and the flowers grow from its top together. This is a very singular and not inelegant appearance. The flower is large, and composed as in the others, of six petals; they are roundish at the ends, and naturally turn up a little at the edges. The colour is a dusky yellowish green, spotted on the outside obscurely, and within more distinctly with a deep blackish purple. The spots are not disposed in chequers, as are most of the others, but they are thrown together with a tolerable regularity. This ripens its seed freely.

Snowy FRITILLARY. This is a variety of the common purple Fritillary, and though less specious than

the generality of the others, should be preferred by all who cultivate this flower, for the variety it gives among them.

The root is small. The stalk is eight inches high, round, weak, and pale. Three or four leaves stand at distances upon it, and these are narrow, long, hollowed, sharp-pointed, and of a lively green. From the top hangs one flower; this is large, broad at the base, and somewhat angulated, plain at the opening and formed as usual of six petals; whose extremities are pointed. The colour is often a pure and perfect white like snow. Sometimes it has a creamy tinge, and some flowers shew a pearly grey. All very elegant, with a lively aspect; and glossy surface. The same seeds will produce others, which are dusky, and want the proper lustre; but these should be destroyed. The white, which is generally uniform and entire, admits sometimes a faint variegation. This is not in chequers, but in a kind of little crescents. It ripens seeds, but they need not be saved; for they are weak in the principle of growth, and there is no certainty of their producing the same flower.

Double FRITILLARY. This is also a variety of the common purple kind, which demands great attention. The root is fleshy, white, and large. The stalk is upright, firm, and pale; sometimes tinged considerably with purple. The leaves are narrow, and of a pale but pleasant green. They stand irregularly, and are not very numerous. One flower terminates the stalk, and it hangs drooping, tho' usually less so than the common kind. It is very broad in proportion to its length, and is composed of twelve petals, sometimes more. But most usually it is double the quantity of the common kind. The colour is throughout a dusky purple, but there is a great and beautiful variegation. The ground part has the purple faint, and mixed with a great deal of green. The spots are perfect purple, and they are regularly square, and placed in the exact chequered order.

This flower will ripen seeds, but they have not the strength of those from the single kinds, nor will they regularly produce double ones. It should therefore be increased by off-sets.

Culture of these FRITILLARIES.

The gardener, in order to get good seed, must watch the plants from their beginning to flower, to the end; for some will be earlier, some later; he must mark for seed the most promising kinds, by tying them up to sticks. This ensures the plants without mistake, and the seed will ripen the better for the stalk being kept from rocking with the wind. The only care must be, that the root is not hurt by the thrusting down the stick.

The plants to be selected, are those which have a strong stalk with a few leaves on it; and have the flower large, wide at the bottom, and regularly opening at the mouth, with the points the least sharp that can be. In the common purple they should be quite strait, neither turning in nor out; and in the Pyrenean kind they should all regularly turn up a little of the verge. These are the marks to be observed for saving seed, as to the colouring it is not material: the chance of culture gave it at the first, and will continue to give it from whatever kind: in this the seed takes no certain effect; but the bigness and shape of the flower, and the firmness of the stalk, are often influenced by it greatly. When these are marked, the usual care must be taken to make them bring their seeds to good maturity. The plants all about them must be cut down; and the mould stirred frequently, and watered a little at a time, and often. The seed vessels must be cut off when full grown, and hardened with a part of the stalk by laying on a shelf for a month: the seeds must be then aired loose about a week, and by that time they will be in perfect good condition for sowing in a proper soil.

The compost proper for these Fritillaries must be made as follows: Mix one barrow of pond mud with two barrows of rich dry pasture earth, and half a peck of hen's dung. Work these well together, then add half a bushel of river-sand, and break them well again. The whole will now come into a fine, mellow, and equal mixture.

mixture. The best time for doing this is as soon as the flowers mark for seed. Let it be spread a foot thick in a shady place, and once in ten days turned.

In the middle of August make two, or more, boxes of rough boards, a foot and a half deep, and of such bigness as can be conveniently managed. Bore four or five holes in the bottom of each; lay some oyster-shells over the holes, and pour in the compost till they are nearly filled. Set the boxes where they may have the morning sun, and scatter on the seeds pretty thick. Sift upon them a finger's breadth of the compost, and lay over the whole a light covering of pease-straw. Let this be taken off when the mould is dry, that it may be watered. This must be done with a light and regular hand; and no moss or weed be suffered to appear upon the mould.

In winter the boxes must be moved to some place where they will be defended from the north, and open to the sun. In spring let them be placed where they were at first.

When the young plants have so much strength that the strongest can be discerned from the rest, let the others be cleared away where they rise too thick, and only such a number left in each box as can be supplied with nourishment. Keep the surface clean from weeds, and water it whenever the mould is too dry. This must be the management while the plants keep their greenness. When the leaves are faded, let half an inch of the compost, that was left, be sifted over them, and let them have the same care they had the preceding year.

The next summer, when the leaves are faded, let the mould be all taken out of the boxes, and sifted. The roots will be thus separated, and they must be immediately planted in a bed of the same compost, sheltered from the north, and from the noon-day sun. They should be set here at four inches distance, and left to flower. There will be a great variety, but let none be despised the first year.

When the leaves are decayed they must be taken up, and immediately planted again, in fresh compost, at five inches distances. This will give them a great advantage for the next year's flowering, and the gardener will then be able to form some judgment of their value.

After the second year's flowering, which is usually the fourth from sowing, the roots are to be considered as arrived at full maturity, and to be treated differently, according to the distinction already made of those which ripen seeds, and such as are to be increased by roots. For this transplanting therefore two beds should be provided, the one larger for receiving those which ripen seeds, and the other for the kinds which are to be increased by roots.

For this purpose, let him mark by separate sticks, while they are in flower, those which have more than one flower upon the stalk, and those which have more than six petals in the flower. No matter whether there be three or four flowers in the first case, or twelve petals, as we have described in the perfect double flowers. If there be more than one upon the stalk, or more than six petals in a flower, continued culture will bring them to the full perfection. The bed must be very well prepared for these; for they are not, after this plantation, to be removed for three years. Let them be set at ten inches distance in the new compost, and the ground kept clean from weeds, and never suffered to be too dry.

This will be all that is requisite in the summer months; but every autumn there should be half an inch of fresh compost sifted over the bed; and in the severe frosts the ground should be covered with pease-haulm.

These being disposed in that manner, the larger bed is to be prepared for the others. They must be taken up as soon as the others are planted, which should be when the leaves fade; and they are not to be kept out of the ground, but immediately set again. They should be allowed eight inches distance, and this management repeated again every year, giving them always fresh compost. Thus will a foundation be laid for the most perfect stock of this singular flower.

The many-flowered and double kinds, will, during three years standing, grow to full perfection, and when they are, at the end of that time, taken up, a number of

off-sets will be found ready for separating by way of encrease.

The others, in the same manner, will flower each year more and more perfectly: every season the finest of them should be marked for seed; and each autumn there should be a new sowing.

Broad-leaved Cluster FRITILLARY. This and the following Fritillary are much later in flowering than any of the preceding. The root of this plant is moderately large: the stalk is firm, round, green, upright, and, according to the soil, from six to sixteen inches in height. The leaves are very numerous, they stand opposite at the bottom; but on the upper part of the stalk are alternate. The lower leaves are also considerably broad, the others are narrow, sharp-pointed, ribbed, and of a pale green. The flowers hang from the tops of the stalks in various directions, but with a wild and pleasing irregularity. Together they form a roundish cluster, and they hang naturally downward, but their stalks twist, and sometimes turn a little upward. Their colour is a dingy purple mixed with yellow. The flower consists of six petals: a broad rib of dusky yellow runs along the middle of each petal, and the sides are purple. There is little of the chequering visible in this part: all that approaches to it, is, that a few purple spots are irregularly scattered over the yellow rib. Within the colours are brighter and placed more regularly: the part nearest the base is chequered, as in the other kinds: the ground colour is yellow, and the chequering purple.

No particular rule is needed for the culture of this Fritillary, it must be managed as directed for the Pyrenean kinds; and the stock must be increased by parting the roots, for it does not well ripen the seed.

Fleshy late FRITILLARY. This is a very elegant plant. The root is moderately large, and has many fibres. The leaves are of a deep green, long, narrow, obtuse, hollowed, and of a fleshy substance. The stalk is ten inches high, purplish at the base, upwards of a pale green, and tolerably firm. The leaves on this stand alternately, and at distances; they resemble those from the root; but that they are smaller; and their ends are often purplish. One flower hangs from the top of the stalk; this is large, and of the most perfect shape: hollowed as a cup, rounded at the base; and formed of six petals, which stand very regularly; they turn in their points at first, but have them perfectly strait when the flower is full blown. Three or four of the upper leaves usually rise perpendicularly over the flower, and are of a fresher green than the others; these add greatly to the beauty of the plant. The colouring of the flower has a delicacy and variety that no other of the Fritillary kind exceeds, and few can be said to equal. The chequering is not formally regular, but it is very pleasing. The ground colour of the flower is a delicate fleshy hue; there runs down the middle of each petal a broad rib of olive, and the spots of a lemon colour: they have something of the square shape, that makes the chequer-work in the other kinds; and they are disposed in such a manner as to resemble it; but there is not the exactness as in many others.

Culture of the late FRITILLARIES.

The culture of these Fritillaries, as we have already observed, differs in nothing from that of the earlier sorts, but their beauty is lost when they are planted promiscuously among them; for they do not come into flower till those are decayed, and the beds are no longer examined; therefore to shew these in perfection as long as possible, a particular bed must be prepared for them in a part of the garden where the sun does not come till about ten in the morning; let this be made up with the same compost directed for the other Fritillaries, and they must be planted at a foot distance. They must have less water than the other kinds; the bed must be kept constantly weeded, and the surface be once in ten days broke with a trowel. This will dispose it to retain the dews, and nothing more is required.

FRITILLARIA-CRASSA, *Stapelia*, a genus of plants, of which there are two species. 1. *Fritillaria-crassa*, with spreading indentures to the branches. 2. *Fritillaria-*

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Fritillaria-crassa, with erect indentures to the branches.

The first sort has many succulent branches, arising from the root, which are five or six inches long, having several protuberant indentures on their sides, spreading open horizontally, ending in acute points; the branches, which spread on the ground, emit roots from their joints, so where they have room will extend very wide. From the sides of the branches toward their bottom, comes out the foot-stalk of the flower at one of the sinuses, and sustains one flower, having a large thick petal, cut half-way into five points, like a star, which spreads open flat; its colour is greenish on the outside, but yellow within, having a circle of purple round the nectarii, and the whole petal is finely spotted with purple, resembling the belly of a frog. The flower when blown, has a very fetid odour, like that of carrion, so like, that the common flesh-fly deposit their eggs on it, which frequently are hatched, but wanting proper food die soon after.

The branches of the second sort are much larger than those of the first, and stand more erect, but spread and emit roots in the same way.

They have four longitudinal furrows, which divide them into four angles, which have protuberant indentures on their edges, whose points are erect. They are nearly of the same colour as those of the first, being of a dark green in summer, but inclining to purple in the autumn. The flowers come out upon short foot-stalks at the sides of the branches; these are shaped like the former, but are larger; the petal is of a thicker substance, and on the inside covered with fine purplish soft hairs. The ground is an herbaceous yellow, streaked and chequered with purplish lines. This sort produces its flowers in much greater plenty than the first, so that in summer and autumn, they are seldom without.

Culture of the FRITILLARIA-CRASSA.

Both these plants are natives of the Cape of Good Hope, where they strike their roots into the crevices of the rocks, and spread themselves greatly.

They are propagated here very easily, by taking off any of the side branches, during the summer months, which when planted, put out roots very freely. The branches should be slipped off from the plants to the bottom, where they are joined by a small ligature, so will not occasion a great wound, the joints at the place where they are connected being almost closed round; for if they are cut through the branch, the wound will be so great as to occasion their rotting when planted. These should be laid in a dry place for eight or ten days, that the wounded part may dry and heal over, before they are planted, otherwise they will rot. They must be planted in pots filled with a compost, made of fresh sandy earth, mixed with lime-rubbish and sea-sand. If the pots are plunged into a moderate hot-bed, it will promote their taking root; they should be now and then sprinkled with water very sparingly, and as soon as they have taken root, they must be inured to the open air.

If these plants are kept in a very moderate stove in winter, and in summer placed in an airy glass-case, where they may enjoy the free air, and at the same time be screened from wet and cold, they will thrive and flower very well; for although they will live in the open air in summer, and may be kept through the winter in a good green-house, yet those plants will not flower so well as those managed in the other way. They must have very little water, especially in winter.

FRONDES, denotes leaves consisting of several other leaves, and forming the whole of the plant, as is the case of the Fern kind, in which the fructifications being on the back of the leaves, the single leaf makes the whole plant, and is called Frondis, not Folium.

FRONDOSE, full of leaves, or shoots.

FRUCTIFICATION of plants. See **GENERATION**, **PLANT**, &c.

FRUCTISTÆ, in botany, that set of authors, who have attempted the establishing the classes and distinctions of plants upon the fruit, seed, or receptacle of these in plants. Of this list are Cæsalpinus, Morinson, Ray, Hermian, and Boerhaave.

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FRUIT, the production of a tree or plant, for the propagation or multiplication of its kind. In this sense the word takes in all kinds of seeds, with their furniture.

But botanists usually understand by it, that part of a plant wherein the seeds are contained. The fruit in all plants is the product or result of the flower, or that, for the production and nutrition of which the flower was intended. The structure and parts of different fruits are different in some things; but in all the species, the essential parts of the fruit appear to be only continuations or expansions of those which are seen in the other parts of the tree, and the same fibres are continued to them from the root. An Apple cut into two transversely, is seen to be principally composed of four parts. 1. A skin or rind, which is only a continuation and expansion of the outer bark of the tree. 2. A parenchyma, or pulp, which is an expansion and intumescence of the blea, or the inner bark of the tree. 3. The fibres, which are ramifications of the woody part of the tree. 4. The core, which is the produce of the pith of the wood, indurated or strengthened by twigs of the woody fibres, intermixed with it. This serves to furnish a proper lodging for the seeds, and filtrates the juices of the parenchyma or pulp, and conveys them to the seeds. Of the fibres there are generally reckoned fifteen branches, of which ten penetrate the parenchyma, and incline to the basis of the flower, and the other five ascend more particularly from the pedicle or stalk, and meet with the former at the base of the flower; and to these branches the capsules or coats of the kernels, are fastened. These branches being first extended through the parenchyma to the flower, furnish the necessary matter for the vegetation of it; but as the fruit increases, it intercepts the aliment, and by this means the flower is starved, and falls off. In a Pear there are five parts to be distinguished: the skin, parenchyma, ramification, stone, and acetarium.

The first three parts are common to the Apple: the stone, observed chiefly in Choak Pears, is a congeries of strong corpuscles, which are dispersed throughout the whole parenchyma, but in the greatest plenty, and amassed closest together about the center of the acetarium. This seems formed of the stony or calculous part of the nutritious juice. The acetarium is a substance of a tart, acid taste, and of a globular figure, inclosed in an assemblage of several of the stony parts before-mentioned. In Plums, Cherries, &c. there are four parts, the coat, parenchyma, ramifications, and stone. The outer part, or shell of the stone, seems formed of the calculous part of the nutritious juice of the plant, and the inner part, or kernel of the pith of the tree, derived thither by seminal branches, which penetrate the base of the stone. The Acorn consists of a shell, cortex, and medulla. The shell consists of a coat and parenchyma, derived from the bark and wood of the tree. The cortex consists of an inner and outer part, the first of which is a duplicature of the inner trunk of the shell, the second is a softer substance, derived from the same parenchyma of the shell. But authors are not agreed whether the medulla, or pulp of the kernel, does arise from the pith of the tree, or from the cortical part thereof. Berries, Grapes, &c. contain, besides, three general parts, viz. coat, parenchyma, and ramification, grains of a stony nature, which are the seeds.

FRUMENTACEOUS, a term applied to such plants as have a conformity with Wheat, called in latin *Frumentum*.

FRUTICOSE, shrubby, from *frutex*, a shrub. See **SHRUB**.

FUCHSIA, a genus of plants, of which we have but one known species.

This plant is a native of the warmest parts of America.

Culture of the FUCHSIA.

It is propagated by seeds, which must be sown in pots, and plunged into a hot-bed of tanners-bark, and treated in the same way as other seeds from warm countries. In about a month or six weeks after the seeds are sown, the plants will begin to appear; when they are about two inches high, they should be shaken out of the pots, and

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separated carefully, planting each into a small pot, and plunged again into a hot-bed of tanners-bark, screening them from the sun, until they have taken new root: then they must have fresh air admitted to them, in proportion to the warmth of the season. As the season advances and becomes warm, the glasses of the hot-bed should be raised higher, to admit a greater share of air to the plants; and when the plants are grown so tall as to reach the glasses, they should be removed into the bark-stove, and plunged into the tan-bed. In winter these plants require to be kept very warm, and at that season they must not have much water, but in summer it must be often repeated, and have much air in warm weather.

FUMATORY, *Fumaria*, a genus of plants, ranged by Linnæus among the *diadelphia hexandria*, and of which there are eleven species. 1. Fumatory, with a naked stalk; or the Cucullaria. 2. Fumatory, with bilobed flowers behind, and a leafy stalk. 3. Fumatory, with a simple stalk, and bractæ as long as the flowers. 4. Fumatory, with narrow pods, growing in panicles, and an erect stalk, called Bastard Fumatory. 5. Fumatory, with narrow, four-cornered pods, and diffused stalks, with acute angles; or the Capnoides. 6. Fumatory, with three trifoliate leaves, and the small leaves heart-shaped. 7. Fumatory, with the seed-vessels growing in a racemus, containing a single seed, and a diffused stalk; or the common Fumatory. 8. Fumatory, with seed-vessels growing in a spike, containing one seed, an upright stalk, and filiform, or thread-like leaves. 9. Fumatory, with seed-vessels growing in a racemus, containing a single seed, and climbing leaves, with short tendrils. 10. Fumatory, with narrow pods, and leaves with clasps. 11. Fumatory, with globular, inflated pods.

The first three species are perennial plants: the first grows naturally in North America, the second in Siberia, and the third in shady and woody places throughout Europe.

The other species of this genus are annual plants. The fourth sort grows naturally in North America, and is a proper plant to grow on the sides of grottos, or rock-work, where by its continuing green all the year, and its long continuance in flower, it has a good effect.

The fifth sort is a native of France, Italy, and Mauritania, and the sixth grows naturally in rocky places in Spain and Sicily; these plants are also proper for the joints of grottos, or any rock-work.

The seventh species is a native of Europe, and particularly of this country; the eighth sort is a native of France, Spain, and Italy.

The ninth species is a native of France and England; and the tenth is also a native of rocky places in England. The eleventh sort grows naturally at the Cape of Good Hope.

Culture of the FUMATORY.

The first three species are propagated by off-sets from the roots, as they seldom ripen their seeds in this country; they require a shady situation and a light soil, and the roots should be transplanted in autumn, soon after the leaves are decayed.

The fourth sort is propagated by seeds, which, if it is permitted to scatter, will raise a new succession of plants every year, without any farther care.

The fifth, sixth, seventh, ninth and tenth species are rarely admitted into gardens.

The eighth sort is only preserved in botanic gardens, for the sake of variety.

The eleventh sort is propagated by seeds, which should be sown upon a moderate hot-bed, in the spring; and when the plants are fit to be removed, they must be planted in a small pot filled with light earth, and plunged again into the hot-bed, where they must be shaded from the sun till they have taken new root: after which they should have a large share of air admitted to them at all times, in mild weather, to prevent their drawing up weak; and as soon as the season is favourable, they should be inured to the open air, into which they may be removed the beginning of June, and planted in a warm border, where their stalks should be supported by sticks, to prevent

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trailing on the ground. In July the plants will flower, and continue a succession of flowers, till the frost destroys the plants. The seeds ripen in autumn.

FURZE, WHINS, GORSE, or SCORPION'S-THORN, *Ulex*, a genus of plants, ranged by Linnæus among the *diadelphia decandria*, and of which there are only two species. 1. Furze, with acute-pointed hairy leaves, and sparsely spines; or the common Furze, Whins, or Gorse. 2. Furze, with single blunt leaves, and simple spines, terminating the branches.

The common Furze is well known to be a native of this country. The second species is a native of Ethiopia.

Culture of the FURZE.

The first sort is propagated by seeds, which were not many years ago frequently sown to form hedges about fields; but as the Furze-hedges in a short time became naked at the bottom, and as there were frequent gaps in the hedge, occasioned by some of the plants often failing, the raising of these hedges has been of late discontinued.

The second species is propagated either by layers or cuttings, but is too tender to live in the open air of this country; it is, therefore, preserved by the curious in green-houses, with the hardier sorts of exotic plants.

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GALENIA, a genus of plants, for which there is no English name, and only one species.

It grows naturally at the Cape of Good Hope, and in other parts of Africa; it rises with a shrubby stalk four feet high, sending out many weak branches. The leaves are very narrow, placed irregularly, and of a light green, with a furrow running longitudinally through the middle. The flowers are produced in loose panicles, from the sides, and at the ends of the branches: they are very small and have no petals.

Culture of the GALENIA.

This plant is propagated by cuttings, which if set during any of the summer months, and watered frequently, will take root in about five or six weeks. In winter they must be placed in the green house, with other hardy exotics, where they must have a large share of air in mild weather, for they only require to be protected from the frost. In summer they may be exposed in the open air, with other plants of the same country.

GARCINIA, *Mangostan* or *Mangosteen*, a genus of plants of which there is but one known species.

This tree grows naturally in the Molucca islands, and also in the inland parts of New Spain. It rises with an upright stem twenty feet high, sending out many branches placed opposite, which stand oblique to each other, not at right angles; the bark of these is smooth, of a grey colour, and that on the tender shoots is green. The leaves are spear-shaped and entire, of a lucid green on their upper side and of an olive colour on their under. The flower is composed of four roundish petals, which are thick at their base, but thinner toward their ends, and of a dark red colour.

The fruit which succeeds the flower is round, and the size of a middling orange. The shell is like that of the Pomegranate, but softer, thicker, and fuller of juice. The inside of the fruit is of a rose colour, it is divided into several parts by thin partitions, in which the seeds are lodged, surrounded by a soft juicy pulp of a delicious flavour. It is esteemed one of the richest fruits in the world. The trees naturally grow in the form of Pyramides, and their branches being decorated with large shining green leaves, make an elegant appearance, and afford a kindly shade in hot countries.

Culture of the GARCINIA.

There are but few of the seeds in this fruit which come to perfection, most of them which have been brought to Europe have failed; therefore the surest way to obtain the plants is to sow the seeds in tubs of earth in

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in their native climate, and when the plants have obtained sufficient strength, they may be brought to Europe; but there should be great care taken in their passage, to screen them from the spray of the sea, as also not to give them too much water, especially when they arrive in a cool or temperate climate, for these plants are very impatient of wet.

When the plants arrive in Europe, they should be carefully transplanted, each into a separate pot, and plunged into the tan-bed, observing to shade them from the sun till they have taken new root; then they must be treated in the same manner as other tender plants from hot countries.

GALLERIES, in gardens, are to be made in the following manner. A line is first to be drawn of the length the gallery is to be, and this is to be planted with Hornbeam, which is to be the foundation of the gallery. These require no farther care than to be sheared a little, and sometimes digged about, as there may be occasion. But the chief curiosity is in the ordering the fore part of the gallery and forming the arches. The pillars of the porticos, or arches, must be placed at four feet distance from one another, and the gallery must be twelve feet high, and ten feet wide that there may be room for three persons to walk abreast in it. When the hornbeams are grown to the height of three feet, the distance of the pillars well regulated, and the ground-works of the gallery finished, the next thing is to form the frontispiece. To perform which the Hornbeam must be stopt between two pillars at the height, and a trellis made for that purpose, must be run up, which forms the arch. As it grows up, those branches which out-top the others must be levelled with the shears; and in time they will grow very strong, and may be kept in regularity by the shears. Portico galleries may be covered with Lime-trees. Galleries in general have been always but lightly esteemed in England; they were once very much in repute in the gardens of Italy, and other hot countries, but now they are got out of credit even there.

GARDEN, a plot of ground cultivated and properly ornamented with a variety of plants, flowers, fruits, &c.

The generality of writers upon this subject, and indeed most gardeners, in their practice, have, at least till of late years, treated the pleasure garden, the fruit garden, and the kitchen garden, as three quite distinct and separate objects, not only in point of culture, but even of situation, soil, and inclosure. They are undoubtedly right as to the first: but we see no reason for disjoining the two last, unless it be in written accounts, where, for the sake of greater order and perspicuity, and for the convenience of the reader, their several products, and the different ways of managing them, may with propriety be given singly, as will be the method here.

Flower GARDEN. This garden should be placed in a properly conspicuous part, where it may afford the greatest entertainment to the eye. It should therefore be placed next to, or just against, the back front of a house, from whence a descent of at least three, but rather of six or seven, steps will singularly embellish the whole. Room should be allowed for a sufficiently extensive lawn, which, if it be the first thing that strikes the sight, will have an elegant effect; for spacious walks, one of which so contrived as to be perfectly dry, and every now and then to lead to a shady place, or into plantations of shrubs, where a person may walk in private, should surround the whole garden, were it only for the benefit of exercise. It should have wildernesses, groves, green-houses, &c. and let the gardener be particularly careful to provide plenty of water for cascades, fountains, and winding streams, which last, if so conducted as to imitate nature, will give life and beauty to the whole, besides being of necessary use for watering the ground. Statues and vases, judiciously disposed, are also, here, pleasing and proper objects: but neither these, nor any of the buildings in the garden, whether temples, grottos, alcoves, or other, should by any means be too much multiplied or crowded.

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The great art of laying out flower-gardens is to adapt their several parts to the natural position of the ground, so as to have as little earth to remove as possible; for this is often one of the greatest expences in making of gardens: though it may with truth be affirmed, that, wherever it has been practised, nine times in ten it has proved the worse; so that if, instead of levelling hills to form large terraces, stiff slopes, and even parterres, or sinking of hollows and raising of hills, the surface of the ground had been only smoothed and well turfed, this would have produced a much better effect; and have been more generally approved, than the greatest number of those gardens which have been made with an infinite expence both of time and of money.

The boundaries of these gardens, whatever they are fenced with, should be carefully hid by plantations of flowering shrubs, intermixed with Laurels and other ever-greens, to conceal the fences, which have a disagreeable look when they are left naked and exposed. All the boundaries should not be seen from any one point of view: and if the country around affords a variety of pleasant prospects, it will be right to bound the pleasure garden by an ha-ha ditch and wall, to lay open those views.

Kitchen and Fruit GARDEN. The chief things to be considered in the choice of a spot of ground for a kitchen and fruit garden are, the soil, the convenience of water, the extents most proper to be inclosed, and the manner of inclosing it and laying it out.

If the gardener can chuse his soil and situation for a garden, the former should be rich, rather stiff than light and considerably deep. Nor is a moderate degree of moisture here by any means an objection. The situation should be nearly level; because heavy rains would wash away the richest part of the mould, if the declivity was considerable. If he has not a level spot near his house, the ground intended for the garden may be made into flats with terraces supported by strong walls, which will become useful for fruit trees.

As warmth is essentially necessary to a garden, it is advisable that the exposure of the ground intended for this purpose be to the south-east, or south; and that it be protected from the north and north-east, either by high grounds or plantations of lofty trees at a small distance. Fruit trees require to be likewise protected from the south-west and west, which are apt, in the autumn, to shake the fruit. The gardener should here spare no trouble or expence to render his soil of a proper quality and depth: and if it be not naturally so, he must have recourse to one or other of the methods practised for the improvement of soils, according to the nature of his ground.

Whatever the soil be, the mould in which the plants are to live and thrive should be deep enough to afford their roots full room to extend themselves. To allow therefore a sufficiency of room, though perhaps more than may be really wanted, a depth of three feet of good mould should be allotted them here; and if the soil underneath is clay, or retentive of water, which would be apt to chill the roots of plants, it will be right to exceed even this depth.

Trenching is the most effectual way to obtain a considerable depth of well-loosened mould. The common method of doing this, when the soil underneath is clay, is to begin with digging a trench four or five feet wide, either along or across the whole ground: then to lay in the bottom of it, about half a foot thick, long dung, fern, leaves of trees, rotten sticks, weeds, or any other such like trash, to rot and keep the soil from binding: then to fill this up with the earth dug out of the next adjoining trench, laying uppermost the spits that were lowest, and so to continue till the work is finished, without ever going deeper than just to the clay, though the surface be never so shallow. But if the clay be dug into, and part of it be turned up and mixed with the other earth, its bad qualities will soon be corrected by the influences of the air, rain, and one winter's frosts; it will become good and fertile mould, and the depth of the staple will be increased thereby, especially with the addition

dition of a little drift sand, coal, or other ashes. The best time for trenching of land, that it may receive the benefit of being well mellowed, is the beginning of winter: when also, being moist, it is easy to dig.

When the mould on the surface is but shallow, and lies on a bed of sand, gravel, or loose earth, it will be advisable to lay a layer of stiff earth, inclining to clay, at the bottom of the trench. This will be more especially necessary for the growth of trees; or plants whose roots naturally pierce deep: for by means of this earth those roots will spread horizontally in the mould, instead of striking down, as they would otherwise do, into barren earth, which would immediately make the trees decay and become stunted. And another advantage attending this method will be, that as water cannot so easily descend through this stiffer soil, the earth will be thereby preserved in a so much moister state; yet even here the clay should not be such as is impervious to water; for this, unless it lie very deep, would be attended with as bad consequences as the other extreme.

The general practice of gardeners is regularly to trench their ground, and lay it rough in the winter, without sufficiently considering the quality of the soil, or the nature of the earth which lies underneath. But a little reflection would convince them of their error. Let us, in this light, see what is the effect of trenches in various soils. If the ground is naturally light, and lies in a bed of sand or gravel. Does not too frequent trenching contribute to this loss, as does likewise laying the surface rough in the winter, for the rains wash the finer mould into the hollow places, from whence, the depth of the soil being least there, it is most readily carried down into the loose earth underneath. If the soil underneath is stiff, frequent trenching is proper, in order to bring back to the surface the rich mould that has been washed down: and if it be naturally strong, the laying of it rough in the winter is an advantage, because the winter's frost will moulder its tough strong particles.

The method of preparing the ground is, undoubtedly, expensive: but its fertility afterwards will yield an ample reward.

Plenty of water is absolutely necessary in this garden, and therefore great care should be taken to provide it, in such a manner that it may be come at as easily as possible. If a sufficient supply of it can be obtained from the neighbouring grounds, two or three basons should be made in different parts of the garden, if it be a large one; for when the water is to be carried to a considerable distance, the expence attending this necessary business will be great, and there will be danger of the plants suffering for want of it. The size of these basons should be proportioned to the quantity of water that will be wanted, or with which they can be supplied: but their depth should not exceed four feet, for fear of accidents, if people should chance to fall into them: besides which, deep water is not so well warmed and tempered by the sun and air, as when it is shallow.

The methods used for collecting and preserving of water in ponds or reservoirs in the field, are equally applicable to the making and replenishing of these basons in the garden. See the article *BASON*.

Where a supply of water for basons and ponds cannot be obtained, wells must be dug, and it generally is advised, that the water taken out of them be exposed to the sun and air for some time, before it is used.

The size of this garden should be in proportion to the wants of the family; but with a much larger allowance of ground than is usually allotted, in order that the plants may be benefited by stirring the earth between them whilst they grow. The great and manifest advantages of this practice, especially in the culture of pulse and garden plants, have been so evidently shewn by numbers of experiments related by many writers of undoubted credit, that it cannot be too often recommended as an object of the highest importance.

It should be inclosed with a wall, either of brick or stone; but brick is best, for the greater conveniency of nailing up the fruit-trees which are to be planted against it. The thickness of these walls should be proportioned

to their height, which some run up to twelve or fourteen feet, or more: but nine or ten will be enough for almost any kind of fruit; and in this case thirteen inches, that is to say, a brick and an half, will be a sufficient thickness; though two bricks will be better, for duration. Their inside should be built as smooth as possible, and, to strengthen them against high winds, piers should be run up with them, at the distance of about twelve or fourteen feet from each other according to the usual extent of the fruit-trees for which they are intended. As to pears, which spread very wide, and frequently grow much above the height here mentioned, they do not require the assistance of a wall; unless it be some of the latest winter sorts, and these the curious, who will be at the expence, may plant against walls built on purpose for them. These piers may project six or eight inches on the outside of the wall, for the sake of greater solidity; and they should advance about four inches on the inside, for the convenience of fixing to them trellises, by building the wall on arches; and planting the trees at those arched places; the trees will be thereby enabled to extend their roots underneath the wall; which will prove very advantageous to their growth.

If the quantity of walling which surrounds the kitchen garden be too little to furnish the desired supply of fruit, a cross wall may be built through the middle of this ground; or, where the size of the garden will admit of it, there may be two cross walls: but these walls must not by any means be less than eighty or an hundred feet asunder.

The best aspect of walls in England is supposed to have them point to the eastward of the south; because they will enjoy the benefit of the morning sun, and be less exposed to the west and south-west winds, which are very injurious to fruits in this country, than those which are built due south. The next best aspect is due south; and the next to that south-east, which is preferable to the south-west, for the reasons before assigned; but as there will, for the most part, be south-west and west walls in every garden, these may be planted with fruits which do not require so much heat to ripen them, as those designed for the best walls, those will only be proper for baking-pears, plums, and morello cherries for preserving; or some duke cherries may be planted against these walls, to supply the table till peaches, nectarines, and plums are ripe. In what ever manner the walls are made, this garden should be well sheltered from the north and north-east, by a distant plantation of high timber-trees, if nature has not otherwise provided a sufficient defence from those quarters.

In the distribution of this garden, particular care should be taken to lay the walks out so as to obtain the greatest convenience that can be for supplying each part of it with manure and water, and as easy access as possible to its different quarters, which may be surrounded by a border planted with espaliers. These walks should be firm enough to bear at least the weight of a loaded wheelbarrow, and wide enough for the convenient carriage of whatever there may be occasion to bring into this garden, or to carry out of it.

The best walks for a kitchen garden are those which are laid with a binding sand; these are the easiest kept of any: for when either weeds or moss begin to grow, scuffling of them over with a Dutch hoe in dry weather, and raking them over a day or two after, will render them as clean as when they were first laid; or if they are covered with dust taken from great roads, it will bind and become very firm.

If the soil is stiff and apt to retain water, narrow under-ground drains should be made by the sides of the walk, to carry off that wet; and where the ground is naturally moist, lime-rubbish, flints, chalk, or any other such material as can be procured with the least expence, should be laid at the bottom of these walks; or if neither of these can be had, the sand should be laid thick upon a bed of heath or furze, and the water will drain through this, so that the walks will be firm and good in all seasons.

The same means will also help greatly to drain away the superfluous moisture of the whole ground, if the soil should be naturally too wet; for if they are not sufficient, more under-ground drains may be made across different parts of the garden, according to its declivity; for most kitchen plants are hurt by too much moisture in winter; and trees never produce good fruit when their roots lie in water.

If each quarter of the kitchen-garden is to be encompassed by espaliers, the walks which divide those quarters should be six feet wide in small gardens, and ten or twelve in extensive ground. On each side of these walks the espaliers should be planted in a border four or five feet wide. These borders may be sown with small fallading, or any other herbs that do not continue long or root deep, so that no ground need be lost: and the continual stirring and manuring of it for these productions, will be of great service to the roots of the trees.

The borders along the south, and other walls that have a good exposure, should be at least eight or ten feet wide, in order to allow the roots of the fruit-trees that are planted against them full room to extend themselves. Such of these as face the south, may be sown for early crops of plants which do not root deep, and those which are exposed to the north, will do for late crops; but no deep rooting plant, especially Pease and Beans, should ever be placed too near the trees: though most gardeners are apt to transgress greatly in this respect, as well to preserve their crops in winter, as to bring them forward in the spring, both which ends might be answered equally well, and without prejudice to their fruit-trees, by making reed-hedges in some of the warmest quarters, and sowing close to them their early Peas, Beans, &c.

A square, or an oblong form will be most agreeable to the eye: but it matters not, in other respects, what shape the garden is of, especially as all gross irregularities may easily be hid in the laying of it out. Thus, when this is done, any of the slips cut off by the garden-wall, may, if large enough, and well exposed to the sun, be set apart for a place to make hot-beds for early Cucumbers, Melons, &c. If possible, this spot should be near to the stables, for the convenience of supplying it with dung; and to have it without the wall, is certainly most eligible, as it will prevent a great deal of filth and litter in the garden, and remove from the nose and eye an object which is not of the most pleasing nature. If this slip is long enough to admit of an annual succession of new beds during two or three years, they will be much better than when they are continued more than one year on the same spot; and as it will be absolutely necessary this Melon-ground should be closed round with a reed-hedge, it may be so contrived as to be moved away in pannels, in such manner, that there will be no occasion to shift any thing more than one of the cross partitions, or fences, each year.

The importance of the precept, particularly here, will justify our mentioning again, that the dung-hill, set apart for this, or for any other purpose of gardening or agriculture, should be carefully kept clear from weeds: for if weeds are suffered to scatter their seeds upon the dung, they will be brought into the garden, or other cultivated ground, shoot up, damage every crop of useful plants, and occasion a perpetual labour to extirpate them.

Another caution which is absolutely necessary to be observed, is to carry off all the refuse leaves and stumps of Cabbages, the stalk of Beans, and haulm of Peas, as soon as they have done bearing: because the ill scent which most people complain of in kitchen-gardens, is wholly occasioned by these things being suffered to rot upon the ground. The leaves of Cabbages may be given to hogs, or other animals, while they are fresh, and the rest of this trash may be thrown upon the dung-hill, which it will help to enrich: or such as will keep may be preserved, to be thrown in the bottom of the trenches, in that part of the garden which is to be trenched the following autumn.

A too common neglect amongst gardeners, is their letting the plants be on the ground, till they have ripened their seeds and wither, not considering that whilst a plant is full of sap, it preserves the earth in a loose state, probably by means of the moisture perspired from its roots; but that, when permitted to stand till its seed is ripe, or the plant wither, it then leaves the impoverished earth dry and hard, being itself become intirely void of sap.

The most important points of general culture here consist in good digging, keeping the ground clean, manuring the soil, and allowing proper distances between the plants, according to their several kinds and growths. But as the various productions of the kitchen, and those of the fruit-garden require very different treatment, though in the same inclosure, it will be right, when you lay out a garden, to consider them separately.

Two essential rules to be observed in the general management of a kitchen-garden, are never to crowd the ground with more plants than it is able to nourish properly, and never to let any part of it remain unoccupied, for want of a due succession of crops.

GARIDELLA, a genus of plants, of which there is but one species.

This plant is very near akin to the Fennel-flower, or Devil in a Bush. It grows wild in Candia, and on mount Baldus: also in Italy and Provence. It is an annual plant, and rises with an upright stalk, dividing into three or four slender branches. The leaves are very narrow, like those of Fennel. The stalks are terminated by one small flower, of a whitish colour, which is succeeded by three capsules, each containing two or three small seeds.

Culture of the GARIDELLA.

It is propagated by seeds, which should be sown in autumn, on a bed of light fresh earth, where the plants are designed to remain. When they come up, they must be carefully cleaned from weeds, and where they are too close, they must be thinned, leaving them about four or five inches apart. This is all the culture the plants will require; and if the seeds are permitted to scatter, the plants will come up without any farther care.

This plant flowers in June and July, and the seeds ripen in September.

GARLICK, *Allium*, a distinct genus of plants according to former botanists, but considered by Linnæus only as a species of the *Allium*, which according to him comprehends the Garlick, strictly so called, the Onion, the Leek, and the Moly, and which he ranges under the *hexandria monogynia*.

Culture of GARLICK.

The common manured Garlick is propagated without any difficulty, by planting the cloves in the spring, in beds about four or five inches distance, and keeping them clear from weeds. The leaves should be tied in knots about the beginning of June, to prevent their running into seed, which will greatly enlarge the bulb.

About the middle of July the roots should be taken out of the ground, and hung up in a dry place for use. The several other sorts of Garlick are very hardy, and will succeed in almost any soil or situation. They may be propagated from their roots or seeds: if from the roots, the best time is autumn, and the seeds may be sown on a border of common earth, either in autumn, soon after they are ripe, or the spring following: after which they will require no other care, but to keep them clear from weeds till the autumn, when the plants may be transplanted into the borders, where they are to remain for good.

GENERATION of Plants. The impregnation of the female Palm-tree by the male, has been known in the most ancient times. Herodotus, the father of history, tells us, that the Greeks called some of these trees male, the fruit of which they bound to the other kind, which bears Dates; that the small flies, where-with the male abounded, might assist in ripening the fruit of the female tree. The remote age in which Herodotus wrote, sufficiently apologizes for his be-

lieving, that what was really brought about by the farina *foecundans* of the male flower, was to be attributed to the insects frequently found therein, and which perhaps frequently carry this farina from the male to the female. The process of the impregnation, according to Theophrastus, was this: while the male plant was in flower, they cut off a branch of these flowers, and scattered the dust up and down therein upon the flowers of the female plant; by which means the female did not cast her fruit, but preserved them to maturity. This has been lately verified at Berlin, where a female Palm-tree bore fruit for many years; but the fruit never ripened, and when planted did not vegetate, merely because there was no male Palm in the place: for having procured a branch of male flowers from Leipzig, twenty German miles from Berlin, they suspended it over the female flowers of their tree; and the experiment succeeded so well, that the female tree produced more than an hundred perfectly ripe fruit; and the experiment being repeated it bore above two thousand ripe fruit, which being planted produced young trees.

It is in the flowers of vegetables only, that the parts subservient to generation are produced; and these flowers are either male, female, or hermaphrodite. Male flowers are those possessed of the organs of generation, analogous to the male parts of animals; such are the stamina and apices, called, by Linnæus, filaments and antheræ. The female flowers are only endowed with parts like those, which perform the office of generation in females; and these are the pistil and its appurtenances, which Linnæus divides into three parts, the germen, style, and stigma. The hermaphrodite flower, which constitutes the great bulk of the vegetable creation, is possessed of all these parts in itself, and is therefore capable of propagating its species without any foreign assistance; which, by many incontestable experiments, it has been found neither the male nor female flower simply is able to do. The impregnation of hermaphrodite flowers may be performed within their own calyx; but before a separate female flower can be so, the farina *foecundans* of the male flower must necessarily be conveyed to it thro' the circumambient air; which is the reason why the quantity of the produce of such plants is much more precarious, than that of plants which have hermaphrodite flowers: for if, during the flowering of these separate male and female plants, the weather proves either very wet or stormy, their produce of fruit will be very inconsiderable, from the spoiling or hasty dissipation of the male farina. Thus, independent of frosts, the fruit of the Nut and Filbert-tree will be most numerous in those years, in which the months of January and February are the least stormy and wet, because at that time their flowers are produced. For the same reasons, a stormy or wet May destroys the chestnuts; and the same weather, in July, prodigiously lessens the crop of Maiz, or Indian corn, as its spikes of male-flowers stand lofty, and at a considerable distance from the female.

Some of the more skilful modern gardeners put in practice, with regard to Melons and Cucumbers, the very method mentioned by Theophrastus two thousand years ago, in regard to the Palm-tree. As these plants, early in the season, are in this climate confined to frames and glasses, the air in which they grow is more stagnant than the open air; whereby the distribution of the farina *foecundans*, so necessary towards the production of the fruit for the propagation of the species, is much hindered. To obviate the inconvenience thence arising, they collect the male flowers when fully blown; and presenting them to the female ones by a stroke of the finger, they scatter the farina *foecundans* therein, which prevents the falling of the fruit before it is ripe.

By far the greater part of plants produce hermaphrodite flowers; but some there are which have separate male and female-flowers growing from the same root, as Maiz, Nettles, Box, Elm, Birch, Oak, Beach, Hazel, Hornbeam, Plane-tree, Pine, Fir, Cypress, Cedar, Melons, Cucumbers, Gourds, and several others: in many of these, the male and female flowers stand at a considerable distance. There are other plants which produce those necessary organs upon different roots, as the Palm-tree,

Hops, the Willow-tree, Mistletoe, Spinach, Hemp, Poplar, French and Dog's Mercury, the Yew-tree, Juniper, and several others. Among these, the *Valisneria* of Linnæus, as to the manner in which its male-flower impregnates the female, is one of the most singular prodigies in nature. It grows in rivulets, ditches, and ponds, in many parts of Europe. The male plant, which is continually covered with water, has a short stalk, upon the top of which its flowers are produced. As this top never reaches the surface of the water, the flowers are thrown off from it, and come unopened to the surface of the water; where, as soon as they arrive, by the action of the air, they expand themselves, and swim round the female flowers, which are blown at the same time. These last have a long spiral footstalk, by which they attain the surface of the water, and remaining there in flower a few days are impregnated by the male flowers detached from the stalks at the bottom.

It is observable, that the operations of nature are carried on most usually by certain general laws, from which however she sometimes deviates. Thus almost all plants have either hermaphrodite flowers, or male and female flowers growing from the same root, or male and female flowers from different roots; but there are a few of another class, which from the same root furnish either male hermaphrodite flowers, or female and hermaphrodite ones: of this kind are the Mulberry-tree, the Musa, or Plantane-tree, White Hellebore, Pellitory, Arrach, the Ash-tree, and few others.—*Watson*, in *Phil. Trans.* Vol. 47. p. 169—183.

Some object to this theory of the generation of plants, from having observed some vegetables, which were termed female, growing singly; and though at a very great distance from any male plants of the same kind, producing perfect fruits, which grew when sown. Mr. Miller tells us, he himself was staggered in his opinion, on having observed a female plant of White Briony, which grew singly in a garden, where there were no other plants of the same kind; which, nevertheless, for several years, produced berries, which grew and flourished perfectly well. This put him upon examining the plant more carefully than he had done before, when a great many male-flowers were found intermixed with the female ones; and he adds, that he has frequently observed the same in many other plants, which are generally male and female in distinct plants, yet have sometimes both sexes on the same plant.

From what has been said, it appears very plain, that the embryo of the female flower must be impregnated by the farina *foecundans*, or male dust, in order to render the fruit perfect; but how, or in what manner, it is performed, is what we can only guess at; since, in the generation of animals, our greatest naturalists differ widely, as has been often shewn, in their opinions concerning the particular method how it is performed. If, says the reverend Dr. Hales, I may be allowed to indulge conjecture, I would propose it to the consideration of naturalists, whether, from the manifest proof we have that sulphur attracts air, a hint may not be taken to enquire whether this may not be the primary use of the farina *foecundans*, to attract and unite with itself, elastic or other refined active particles. That this farina abounds with sulphur, and that a very refined sort, is probable from the subtle oil which chemists obtain from the chives of Saffron: and if this be the use of it, was it possible that it could be more aptly placed than on the slender points of the stamina, where it might easily, with the least breath of wind, be dispersed in the air; thereby surrounding the plant, as it were, with an atmosphere of sublimed sulphureous pounce? These uniting with particles of air, may, perhaps, be inspired at several parts of the plant, and especially at the pistil, and be thence conveyed to the capsula seminalis. And if to these united sulphureous and aerial particles, we suppose some particles of light to be joined (for Sir Isaac Newton has found that sulphur attracts light strongly); then the result of these three by far the most active principles in nature will be a *punctum saliens*, to invigorate the seminal plant: and thus

thus we are at last conducted, by the regular analysis of vegetable nature, to the first enlivening principle of their minutest origin.

GENTIAN, or **FELLWORT**, *Gentiana*, a genus of plants, ranged by Linnæus among the *pentandria digynia*, and of which he enumerates no less than twenty-three species, too many to meet with a particular description in this work; nor is it necessary, as all that are admitted into gardens require much the same culture.

Culture of the GENTIAN.

Almost all the species of the Gentian are natives of different parts of Europe. Some grow naturally in England, and a few are natives of America. Some are annual plants, but the greatest part of them have perennial roots. These are propagated by seeds, which should be sown in pots soon after they are ripe: the pots must be placed in a shady situation, and kept clear from weeds: in spring the plants will come up; they must be duly watered in dry weather, and kept clean from weeds, and in the following autumn, should be carefully shaken out of the pots, and planted in a shady border of loamy earth, at the distance of six inches apart. In this border the plants may stand two years, by which time they will be fit to transplant where they are designed to remain; therefore, in autumn, so soon as their leaves decay, let them be dug up with such care, as not to injure their roots, and planted in their places; after which they will require no other culture, but to dig the ground about them early in the spring, before they begin to shoot, and in summer, to keep them clean from weeds.

The roots of these plants will continue many years, but the stalks decay every autumn. The same roots do not flower two years together, nor seldom oftener than every third year; but when they flower strong, they make a fine appearance.

GENTIANELLA, a species of Gentian. See the last article.

GERANIUM, *Crane's Bill*, a genus of plants ranged by Linnæus among the *monadelphica decandria*, and of which he distinguishes thirty-nine species. Miller enumerates forty-three, and Tournefort seventy eight; too great a number to be all inserted in this work.

Several species of this plant are natives of England, and are troublesome weeds in a garden; others grow naturally in France, Italy, Spain, and Germany, and are preserved in botanic gardens for the sake of variety; but, as they are plants of little beauty, they are rarely admitted into other gardens. There are also several African species of this genus preserved in various gardens, where there is a conveniency to screen them from the frost in winter.

The common wild sort of this plant, and those also which are brought to the curious from the colder climates are hardy enough, and require little care; but the African species, and the others from hot countries, which make so very beautiful a figure in our green houses, require great care in their culture and propagation.

African GERANIUM. This plant has every recommendation to the curious which beauty of flower, fragrance, and a peculiar elegance can give it.

It is a shrubby but tender plant, three feet high, and irregularly, but not inelegantly spreading in its branches. The leaves are large and roundish but they are heart-like at the base, and indented at the edge; they are distinguished by an elegant and conspicuous zone carried all round them: the flowers stand in large tufts placed in the summits of long foot-stalks, and they are large and of a beautiful red. The seed-vessel is long, slender, and sharp-pointed; it resembles the beak of a crane, and the whole genus has thence obtained the English name of *Cranes-Bill*.

There are beside this a number of other African Geraniums, which we shall particularize hereafter: and as they are all to be raised by the same kind of culture, we shall deliver the method of it at large.

Culture of the African GERANIUM.

The soil, in their native place of growth, is so unlike what we have usually in gardens, that the care of their

culture must be begun farther back than is needful for many other plants.

The custom is to raise them in pots of good mould, and they will be very beautiful that way; but in the method we shall propose they will rival the glowing beauty they display in their natural climate. There they grow principally where the ground is warm, dry, and light, and yet has some richness.

About August, let an artificial soil be prepared for these plants, thus: Pare off the surface of some ground on which an old stock of wood has stood, and take only what is light and mellow; to one load of this add two loads of good garden mould, and a load and a half of middling sand, and half a load of burnt grass turf: mix all these well together with spade and rake, and pile the whole in a ridge, and let it thus lie till the month of January. Then let it be thoroughly dug up and turned, and thrown together in a ridge again, where it is to lie till the succeeding summer, the time of using it.

During this interval, if weeds appear upon it, they must be cut down with a hoe, for they will exhaust it; and the intent is, that all its richness should go to the nourishment of the plant.

The artificial soil being thus prepared, the method of propagating the plants comes under consideration. Their seeds do not often come to a perfect maturity with us, and the cuttings grow easily; for this reason it is best to use them for propagation; and a larger number of plants may be raised this way with speed and success in the following manner:

Chuse a part of the nursery which is warm and well sheltered, and is not too much exposed to the sun: here prepare a bed four foot and a half wide, of what length you please, and let it have a foot and a half depth of the finest mould. Let the mould lie half a foot within the ground, and a foot above it, and let it be well broken and laid perfectly even: at distances place hoops, that the whole may, on occasion, be covered with matting; and on the surface draw lines for planting the cuttings at two feet distances row from row, and two and a half in the rows.

Towards the end of May is the time for this work; and when the bed is thus prepared, let cuttings be taken carefully from some good kinds of Geranium, and from the most flourishing plants. These must be immediately placed in the mould, five inches deep, and well set; then give the bed a watering, and draw the mat over it. At sun-set let the mats be taken off, and so every night; only drawing it on an hour after sun-rising in the morning; this will give them the advantage of the dews; and they are to be uncovered in the same manner in the day, whenever there falls a moderate shower: they must also be watered frequently and moderately, as the condition of the ground requires; and, by this practice, in five weeks they will take good root.

If the cuttings were planted the third week in May, they will have taken tolerable root at the latter end of June; and they will, in a month more, have shot so many additional fibres, that they will be in a condition to remove: therefore, the last week in July will be the proper time for that operation.

The artificial soil is now to be once again very well worked over; and the pots, into which the Geraniums are to be put, must be filled with it: these should be of a middling size. Bring them to the bed, and after sun-set plant in the young Geraniums: each is to be taken up carefully, with as much earth to the roots as will hang about them; in this condition it is to be set upright in the middle of the pot, which is to be half emptied for that purpose: then the remainder of the artificial soil is to be carefully put in, and closed about the plant. When they are thus fixed in the pots, they must have a gentle watering; and the pots must be set upon the bed where the plants stood, and in the morning the mat drawn over them. They must be managed exactly as the cuttings were, when first put into the ground, till they are very well rooted in the pots: they must then be brought out into a more open place, and watered occasionally as the condition of the earth requires. About ten

ten days fixes them very well in their pots; and they are then to stand out till the end of Autumn, at which time they are to be carried into the green-house. They must then be set in the most airy place, and not sheltered by larger plants. They must have now and then a little water, and the surface of the earth must be stirred once in a month. In summer, when they are set out, the earth should be taken off two inches deep, and its place supplied by a fresh parcel of the same artificial soil.

Purple GERANIUM, with *auriculated leaves*. This plant adds singularity in the manner of its growth, to the common character of elegance, and therefore merits, on more accounts than one, a place among the exotics we raise in our gardens.

The root is white and fibrous: the leaves rise from it in clusters, and spread themselves with a pleasing irregularity upon the ground; each has its separate long foot-stalk, which is naturally of a whitish green, but often reddish; the leaves vary among themselves, some are simple, and others formed, as it were, of three parts; the simple leaves are oblong, broad, obtuse, and irregularly dented at the edges: the others are of the same form, but they have beside, a couple of small leaves at their base; they are all of a beautiful green, and make a handsome appearance. The stalks rise in the tuft, and they are low and naked, about ten inches is their usual height: and at the top there burst from a divided general cup, many slender separate pedicles, each sustaining a single flower; the whole cluster forms a kind of round umbel, and is very regular and handsome; each flower is large and of a shining purple, with a tinge of scarlet. The seeds are gathered into a crane-like head, as in the other Geraniums, and these are considerably large in proportion to the plant.

Culture of this GERANIUM.

This is a species which must be raised from seeds, and the choice lies between those ripened on plants at home, and such as may be imported from Africa. There need be but little said of the preference that is to be given to the African seeds, when they can be had fresh; but those the plants ripens here will produce it, and it may be propagated also by parting the root; the seeds, whether obtained from abroad, or ripened here, must be sown in February, in pots of a compost made with equal parts of garden-mould and wood-pile earth; these must be set in a bark-bed: and when the plants have a little height, they must be transplanted into separate pots, in which they are to remain some time in another hot-bed; after this, they must by degrees, be hardened, and then set out among the exotics which bear the free air of our summers; they will usually, with good management, flower the first year, and they scarce ever miss the second. They are to be preserved in winter in the green-house, and require no other care than what is bestowed upon all other plants placed in those buildings.

Vine-leaved GERANIUM. This is a very elegant and fragrant flower.

The root is roundish, brown, and full of fibres. The first leaves rise in numbers, and these are supported on long thick hairy foot-stalks: these are sometimes purplish, but naturally green: and the leaves are also of a fine bright green; they are large, broad, deeply divided in several places, not unlike some kinds of Vine-leaves: they are highly ribbed and lightly hairy. Frequently at their bases there stands one or two little appendages, but this is not constant.

In the centre of this tuft of leaves rises the stalk, which supports the flowers. This is round, thick, hairy, purplish at the bottom, and on the upper part green. The flowers spread out in very elegant tufts, and they are in themselves large and beautiful. Their colour, in the middle part of the petals, is a delicate red, but the edges of them are naturally of a pale yellow. They are placed on hairy foot-stalks, singly sometimes, but oftener in clusters: and they are succeeded by long beaks, in the manner of the other plants of this singular kind.

Culture of the Vine-leaved GERANIUM.

A proper compost for this plant must be made as follows: take two barrows of mould, from a fertile but

dry pasture, one barrow of earth from under an old wood-pile, and half a barrow of large coarse sand; mix these well together, and throw it up in a heap several months before it is wanted; keep it clear from weeds by frequent turnings.

If possible, procure seeds from Africa, but in other cases let the best of those it ripens here, be carefully preserved during winter, and in spring they should be sown upon a well covered hot-bed, and buried half an inch. The plants will soon come up; and when they have acquired a little strength, they must be removed into another, and set at greater distances. In this they must be shaded and watered to promote their rooting, and when they are somewhat more advanced in bigness, removed into pots. Common mould serves very well the purpose of covering the two hot-beds: but the compost prepared for them must be now put into the pots.

First let some pebbles be laid in the bottom of the pot, then let it be half or more, filled with the compost: and being thus prepared, let the plants be taken up one by one, with as much of the mould as will hang to the roots, and set upright in the pots. Let more of the compost be poured in to fill them up to a proper height, and the plants secured upright: then give them a gentle watering, and place them either in a bark-bed that has but little heat, or under a common hot-bed frame to help their rooting. Here they must be covered, shaded, and watered, till well rooted again: and after that the glasses must by degrees be raised more and more, in the heat of the day, to harden them: and they must afterwards be set out among the green-house plants.

They will flower, with good management, the first year; they must be taken in at the approach of winter, and they will every year afterwards flower stronger and stronger: and will, in time, produce off-sets from their roots, which being nursed up with the same care as the seedling plants, will sooner come to the full glory of their flowering. They will always flower the best when they have most free air.

Crimson Papilionaceous-flowered GERANIUM. This plant is singular and elegant in the highest degree, and worthy a place in the best collection.

The root is tuberous and brown: round, and of the size of a Turnep. The leaves that rise first from it are large and very beautifully divided: they have long, hairy, reddish foot-stalks, and they are cut into numerous narrow segments; their colour is a beautiful pale green. In the centre of a large tuft of these, rises the stalk, which supports the flowers; it is united with some of the inner ones at its base, but all the way from thence it is naked; it is purplish at the bottom, of a whitish green toward the top, and hairy. The flowers terminate this in a kind of umbel, they are very large, and of an elegant pale crimson: they stand on long and slender foot-stalks, a part of their petals hanging down, and the rest standing erect; each flower has the aspect of the Papilionaceous kind. In the centre appear the tops of the style, which is also of a fine crimson, and adds not a little to the elegance of the flower.

The more attentively the flower is examined the more it pleases. The cup in which it stands, is formed of a single leaf, and divided into five segments. The body of the flower is composed of five perals, and of these, three are turned up in the same manner we have mentioned, and the other two hang down, which gives an air of singularity to the flower. Mentioning the colour to be throughout crimson, is describing it in the most perfect state, for it is frequently white; but even in that case it is not without its beauty; for at the part where the lower petals droop, it is stained with two large and elegant spots of crimson.

Culture of the Papilionaceous GERANIUM.

This plant is a native of Africa, where it spreads its leaves over the dry earth, by the sides of forests, in a pleasing luxuriance. The soil in these places is a light sandy loam, enriched by the rotted branches of the trees. This points out the compost that is to be given it in our gardens.

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For this purpose bring in a barrow of light sandy earth from under the turf in a common pasture: mix with it a bushel of earth from under an old wood-pile, and add a peck of the compost sand: let this be prepared several months before it is used, and turned frequently, that no weeds may grow upon it, and that it may have all the advantage of sun, air, and rains.

There are two methods of propagating this plant, the one by parting the roots, the other by sowing. The way by off-sets from the root is easiest and most expeditious; but this is a kind which produces those off-sets slowly. It ripens its seeds very well with us, and therefore that is the best way of procuring its encrease. Early in spring let these be sown upon a hot-bed, scattering a few at a distance, one from another, and covering them a quarter of an inch with fine mould.

When the plants appear, pull up the weakest, leaving only about half a dozen, and these at a good distance; thus they may stand till they have some little height, then they must be removed into another hot-bed: and after being some time in that, transplanted into pots filled with the compost. These pots must be set in a hot-bed frame, and watered carefully; they must also be shaded till well rooted, and then hardened to the air by degrees.

When the summer is advanced, they must be set out among the exotics, and at the approach of winter taken into the green-house. Some of these seedling plants will bear crimson, and others white flowers.

There is no way to be sure of the colour of the flowers but by off-sets from their roots, and these, when they can be had good, deserve the preference; they must be planted singly in pots of the same compost, and after one gentle watering, set in a shady place. When they begin to shoot, they must be brought where there is a more free air, and some sun, and from that time watered gently once in two days.

They will quickly come forward under this management; and they are then to be brought out among the exotics for the remainder of the summer, and afterwards treated in all respects as the others.

Tree GERMANDER, Teucrium, a genus of plants, of which there are nineteen species. 1. Tree Germander, with heart-shaped waved leaves, which are bluntly sawed, those between the flowers spear-shaped and entire, and a shrubby stalk; or common Tree Germander. 2. Tree Germander, with oval crenated leaves, those between the flowers spear-shaped and entire, and a shrubby stalk, or shrubby Alpine Tree Germander, with shining leaves. 3. Tree Germander, with entire, oblong, oval leaves, having foot-stalks, smooth above, and hoary underneath; or Spanish Tree Germander. 4. Tree Germander, with entire leaves, which are hairy, shaped like an acute Rhombus, and woolly on their under-side. 5. Germander, with many pointed leaves, and flowers growing singly. 6. Germander, with many pointed leaves, and flowers growing in whorls by threes. 7. Germander, with oval leaves on foot-stalks, with crenated cuts, and flowers growing almost in whorls; or smaller creeping Germander. 8. Germander, with oval leaves, which are pointed at both ends, saw-indented toward their points, and flowers growing in bunches. 9. Germander, with oblong, oval leaves, which are acute-pointed, jagged and crenated, and have flowers growing almost in whorls; or greater creeping Germander. 10. Germander, with oval, woolly leaves, which are obtusely crenated, those among the flowers entire, and the empalements of the flowers ending in acute points. 11. Germander, with oblong, oval leaves, which are sawed toward their points, hairy, and hoary on their under-side, sitting close to the branches, and flowers growing almost in whorls; or hoary Alpine Germander. 12. Germander, with heart-shaped, sawed leaves, having foot-stalks, many long bunches of flowers growing from the wings, and an upright stalk; or Wild Sage. 13. Germander, with oblong, saw-indented leaves, sitting close to the branches, and flowers growing by pairs at the wings of the stalk, which is diffused; or Water Germander. 14. Germander, with oval entire leaves, which are pointed at both ends, and hairy

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bunches of flowers; Syrian Mastick, or common Marum. 15. Germander, with linear, trifid, entire leaves, and flowers sitting close, growing out of the wings of the branches; or common Ground Pine. 16. Germander with the most hairy linear leaves, which are indented toward their points, and flowers sitting close to the wings of the stalk; or Musk-Ground Pine. 17. Germander with linear, woolly, entire leaves, and flowers sitting close to the branches, or Musk Ground Pine with entire leaves. 18. Germander with oblong, oval leaves, which are bluntly indented, and flowers placed singly at the wings of the stalks, having acute empalements. 19. Germander with oval spear-shaped leaves which are unequally sawed, and long bunches of flowers springing from the wings, and terminating the stalks, and inflated empalements.

The first species grows naturally in the south of France, in Spain and Italy; it rises with a shrubby stalk two or three feet high. The leaves are heart-shaped, a little waved, and bluntly sawed on their edges, and of a lucid green on their upper side, but a little hoary on their under, standing upon short footstalks. The upper part of the branches, for six or eight inches in length, are adorned with flowers, which come out from the wings of the stalk, two or three standing on each side at every joint; they are of a dingy white colour, and stand upon slender footstalks; under each of these whorls stand two smaller leaves, which are entire and concave.

The second sort grows naturally on the Alps, but in the lower parts, where the cold is not very severe, and generally on moist ground; this has a shrubby stalk like the former, and rises about the same height. The stalks are covered with a short hairy down; the lower leaves are oval, crenated, and of a lucid green on their upper-side, but a little hoary on their under; the leaves between the flowers are spear-shaped and entire. The spikes of flowers are much longer; the flowers are larger, and their colour more inclining to a yellow than those of the former.

The third species grows naturally in Spain and Sicily, near the borders of the sea; this rises with a shrubby branching stalk, six or eight feet high, covered with a hoary bark. The branches are decorated with small oval leaves, placed opposite, sitting close to them; they are smooth on their upper side, of a lucid green, but their under sides are hoary. The flowers come out singly from the wings of the stalk at the upper part of the branches, one on each side standing upon short footstalks; their empalements are short and hoary. The flowers are blue. This plant seldom produces good seeds in England.

The fourth sort grows naturally in Spain; this has a great resemblance of the third, but the branches spread more horizontally. The leaves are sometimes heart-shaped, and at others in form of a rhombus; the lower leaves, which are the largest, are an inch and a half long; and three quarters of an inch broad; the upper are smaller, and of a different shape; these are downy on both sides, but the lower leaves are only so on the under. The flowers come out at the upper parts of the branches in like manner as the former, but are larger, and of paler blue colour.

The fifth sort grows naturally in Spain and Italy, upon moist ground. The stalks of this are herbaceous and trail upon the ground; they grow about a foot in length, and the leaves are cut in many points almost to the midrib; they are smooth, stand opposite, and their colour is a deep green. The flowers are white, and come out on each side the stalks singly; these are succeeded by four seeds which ripen in autumn.

The sixth species grows naturally in the south of France, Italy, and Germany, in the corn fields; it is an annual plant which perishes soon after the seeds are ripe.

The stalks are four-cornered, hairy, and about a foot long. The leaves are placed opposite at every joint, they are hairy, and almost cut to the midrib; the segments are cut into three points. The flowers are placed at the wings of the stalks in whorls, three standing together

gether on each side upon short footstalks. They are white and shaped like those of the other species. The seeds ripen in August and September.

The seventh species grows naturally in the south of France, and in Germany; this has a creeping fibrous root, which spreads in the ground, and multiplies greatly; sending out many four-cornered hairy stalks, which are eight or nine inches long, having a few short branches, decorated with oval leaves, which are deeply crenated on their borders; they stand upon footstalks; and are of a green above, but hoary underneath. The flowers grow from the wings of the stalks, towards the upper part almost in whorls, standing chiefly to one side of the stalk; they are of a reddish colour, and the lower tip turned inward. The seeds ripen in autumn.

The eighth sort is a native of Spain, this is a perennial plant, having some resemblance of the former, but the roots do not creep. The stalks are taller and more erect. The leaves are narrower, pointed at both ends, and not so deeply indented, but the indentures are sharper. The flowers decorate the stalks great part of their length, they grow in bunches, are longer than those of the former, and of a bright red colour.

The ninth sort is a native of Italy; this is like the seventh sort, but the stalks rise nearly twice the height of those, and send out a greater number of branches. The leaves of this are more acutely indented on their edges; they are hairy, of a light green on their upper side, and hoary on their under. The flowers grow almost in whorls from the wings of the stalks, to which they sit very close. They are sometimes red, and at others white, and both colours are often on the same plant.

The tenth sort grows naturally in the island of Crete, and also about Nice in Italy; this is a perennial plant with a low shrubby stalk, sending out many four-cornered branches. The leaves are oval, woolly on both sides, and are bluntly crenated on their borders. The upper part of the branches are adorned with purple flowers in whorls, having two small oval entire leaves under each whorl; the flowers are as large as those of the first sort, but their cups are very woolly, and their indentures end in sharp points. When the season proves warm and dry, the plants will produce good seeds in England.

The eleventh species grows naturally on the Alps. This is very like the seventh sort, but the stalks and leaves are very hairy, sawed toward their points, hoary on their under side, and sit close to the branches. The flowers are larger than those of the seventh sort, and are of a paler red. The seeds ripen in August.

The twelfth sort is the common wild or wood Sage, which grows naturally in woods and thickets in many parts of England, so is rarely admitted into gardens. It thrives in any soil or situation.

The thirteenth species is the common Water German-der, which grows naturally in the isle of Ely, and some other fenny parts of England. It has a small, stringy, fibrous, creeping root, which is perennial, from which arise many four-cornered, trailing, diffused stalks. The leaves are oblong, hairy, and indented, sitting close to the stalks. The flowers are produced at the wings of the stalks, two rising on each side, at every joint. They are of a purple colour and sit very close to the bottom of the leaves; these appear in July, but are seldom succeeded by seeds.

The fourteenth sort is the Common or Syrian Marum, which grows naturally in Syria, and also in the kingdom of Valencia. It has a low shrubby stalk, sending out many ligneous branches, which in warm countries will rise three or four feet high, but in England it is rarely seen above half that height. The stalks are very hoary; the leaves are small, oval, opposite at each joint, and pointed at both ends: they are hoary, and have a piercing grateful scent, so quick as to cause sneezing. The flowers grow in loose whorled spikes at the ends of the branches, of a bright red colour. They appear in July and August, but are not succeeded by seeds in England.

The fifteenth sort is the Common Ground Pine, which grows naturally on chalky arable land in several parts of England.

The sixteenth sort grows naturally in the south of France, in Italy and Spain. It is an annual plant, with a single ligneous root sending out a few fibres. The stalks are about six inches high. The leaves are narrow, very hairy, and indented towards their points. The flowers come out from the wings of the stalks, to which they sit very close; they are large, and their colour is a beautiful bright purple. These appear in July, but unless the season proves favourable, they are not succeeded by seeds in England.

The seventeenth sort grows naturally about Nice in Italy; this is also an annual plant, much like the former, but the leaves are narrower and entire. The whole plant is covered with white woolly hairs, and the flowers are smaller than those of the former.

The eighteenth is a native of La Vera Cruz; this is an annual plant, with an erect four-cornered stalk a foot and a half high. The leaves are smooth, oblong, oval, and bluntly indented. The flowers are situated at the wings of the stalks, two of them arising at each joint, upon short slender footstalks; they are small and white, having short impalements, which are cut at the brim into five very acute points. These appear in July and are succeeded by seeds which ripen in autumn.

The nineteenth species is a native of the same place; this is an annual plant, it rises with a slender, upright, four-cornered stalk, to the height of three feet. The leaves are three inches long, and one broad; oval, spear-shaped, of a bright green on their upper side, but pale on their under; they are unequally sawed on their edges, and stand upon long footstalks. The flowers appear, in long bunches, at the wings of the stalk, and also at the top. They are pretty large, white, and have bladdered impalements. These appear late in July, and unless the season proves favourable, no good seeds will succeed them.

Culture of the Tree GERMANDER.

The first, second, third, fourth, and tenth species are propagated by cuttings, which should be planted in spring, on a bed of light fresh earth, observing to shade and water them till they have taken root; after which they will require no farther care, than to be kept clear from weeds, till the following autumn, at which time they should be transplanted where they are to remain. In removing them preserve as much of the former earth to their roots as possible. If the season should prove dry they must be watered till they have taken fresh root. Always observe to keep the ground clean about them, and prune off such shoots as are ill situated, and the flowering branches when they decay.

They may also be propagated by seeds. If these are sown upon a bed of light earth in April the plants will come up in six weeks after, and may be transplanted in autumn, where they are designed to remain.

The third sort is often preserved in pots, for though it will endure the cold of our ordinary winters, if planted on a dry soil, and in a warm situation; yet, in severe frosts, it is often destroyed; it therefore, at such times, requires the shelter of the green-house.

The fifth species is preserved in botanic gardens for the sake of variety. It is propagated by seeds, which may be sown in the spring in the place where the plants are to remain. When these come up they will require no other culture than being kept clean from weeds.

The sixth species is also propagated by seeds, which if sown in autumn, or permitted to scatter when ripe, will succeed better than if sown in the spring, and the plants will come earlier to flower.

The seventh species propagates very fast by its creeping root. The best time to transplant it is in autumn. The eleventh sort may be propagated in the same manner.

The eighth species is propagated by parting of the roots in autumn, or by sowing of the seeds at the same season, which will more certainly succeed than those which

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which are sown in spring. It loves an open situation exposed to the sun, but will thrive in almost any soil which is not too moist.

The twelfth species is never admitted into gardens.

The thirteenth may be propagated by its creeping roots, or planting the young shoots in the spring, in the same manner as Mint, &c. It should have a moist soil, otherwise it will not thrive in gardens.

The fourteenth species is easily propagated by slips or cuttings, which, if planted during the summer months on a bed of light loamy earth, covering them down close either with bell or hand-glasses, and shading them from the sun will put out roots very freely; after which they should be transplanted either into separate small pots, or on a warm border at about six inches distance every way, observing to shade them from the sun, and to give them gentle waterings till they have taken new root; after which they will require no other care than to be kept clean from weeds.

These plants will live through the winter in the open air, if they are planted in a dry soil and a warm situation, when the frosts are not very severe; but in very hard winters they are frequently killed, if they are not protected by mats or some other covering.

The cats are very fond of this plant, and where there are but few will destroy them, if care is not taken to prevent it; but when there is a great number of the plants together, the cats seldom touch them.

If the seeds of the fifteenth, sixteenth, and seventeenth species are permitted to scatter, the plants will come up better than if sown, and require no other care but to thin them, and to keep them clean from weeds; or if the seeds are sown it should be in autumn, for they rarely succeed when they are sown in spring.

The eighteenth and nineteenth species are too tender to thrive in the open air of our climate. The seeds of these should therefore be sown in autumn, in small pots, which must be plunged into the tan-bed in the stove, where they should remain till spring, when they may be taken out and plunged into a hot-bed, which will bring up the plants. When these are fit to remove they should be each planted in a separate pot, and plunged into a hot-bed, and afterwards treated in the same manner as other tender plants which require constant shelter.

False GERMANDER, a species of Veronica or Speedwell. See the article SPEEDWELL.

Water GERMANDER. See *Tree GERMANDER*.

GERMEN. The rudiment of the fruit, accompanying the flower; but not yet arrived at maturity.

GESNERA, a genus of plants of which there are only two species. 1. Gesnera with a large woolly Fox-glove leaf. 2. Low Gesnera with a yellowish flower.

The first species is a native of Jamaica. It rises with a shrubby stalk to the height of six, and sometimes seven feet, and divides into two or three irregular branches, covered with a russet wool. The leaves are seven or eight inches long, and two and a half broad in the middle, with a russet woolly midrib; the edges are crenated, and they have short footstalks. Towards the ends of the branches are placed the footstalks of the flowers at the joints, arising from the wings of the stalk, which are naked, branching at the top into many smaller footstalks, each sustaining a single flower, with a short crooked tube, indented at the top in five obtuse segments of a purple colour. It flowers in July and August.

The second species is a native of Carthage in New Spain, it seldom rises more than three feet high. The leaves are much smaller than those of the former, they are sawed on their edges, and sit close to the stalk; the flowers stand upon branching footstalks, each sustaining many flowers, which are deeper cut at the brims than those of the first sort. They are of a yellowish colour.

Culture of the GESNERA.

These plants are propagated by seeds, which should be sown in pots and plunged into a hot-bed of tanner's bark, as soon as they arrive in England, for

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they sometimes remain from autumn till the spring following in the ground; therefore when they happen to arrive at that season, the pots in which the seeds are sown, should be plunged into the tan-bed in the stove, and during the winter the earth should be now and then gently watered, to prevent its drying too much, but it must not be too moist.

In the spring the pots should be removed out of the stove, and plunged into a fresh hot-bed which will bring up the plants soon after. When these are fit to remove, they should be each planted into a separate pot, and plunged into a good hot-bed of tan, observing to shade them till they have taken new root, after which they must be treated in the same way as other tender exotics.

In autumn they must be plunged into the tan-bed in the stove, where they must constantly remain, for they will not thrive out of the tan-bed. In the summer they should have free air admitted to them at all times, when the weather is warm. As the plants advance in growth they will require larger pots; but care must be taken not to over-pot them, for they will not thrive in large pots.

GEUM, *Avens* or *Herb Bennet*, a genus of plants ranged by Linnæus among the *icosandria polyginia*, and of which there are five species. 1. Geum with upright flowers, a globular fruit, with naked hooked beards, and trifoliate leaves. 2. Geum with upright flowers, a globular fruit, and harp-shaped leaves, or the common *Avens*, or *Herb Bennet*. 3. Geum with nodding flowers, and an oblong fruit, with feathery beards, or the *Aquatic Herb Bennet*. 4. Geum with a single upright flower, and an oblong fruit, with feathery beards. 5. Geum with uniform small leaves, cut at the edges, alternately smaller, and a creeping stalk.

These are perennial plants. The first species is a native of North America. It rises two feet and a half high. The main stem branches out at the top into small footstalks, each being terminated by a small white flower.

The second sort grows plentifully by the sides of hedges, and in woods in many parts of England, and other countries in Europe.

The third species is the purple *Marsh Avens*, and grows naturally in moist meadows in several parts of Europe, and particularly in the north of England.

The fourth sort grows naturally upon the Alps. The stalk seldom rises more than five or six inches high. The leaves are composed of three or four pair of small irregular pinnæ, set along the midrib, which is terminated by one very broad roundish lobe, crenated on the edge. The flowers are large, of a bright yellow colour, and stand single on the top of the stalk. It flowers in May and June.

The fifth species is a native of Switzerland. This is a very low plant, the flower-stalks are about three inches long, and bend on one side; they are each terminated by one bright yellow flower. It flowers about the same time as the former.

Culture of the GEUM.

These are all hardy plants, easily propagated by seeds, which should be sown in autumn; for when they are sown in the spring, they do not grow that year.

The plants require a shady situation, but will grow in any soil.

GIBBOUS, a term used by botanists, to denote any protuberance, or convexity of a seed, fruit, &c.

GILLY-FLOWER, or **CLOVE GILLY-FLOWER**, or **JULY-FLOWER**, a species of the *Carnation*. See the article *CARNATION*.

Queen's GILLY-FLOWER. See *ROCKET*.

Stock GILLY-FLOWER. See *Stock July-flower*.

GINGER, *Amomum*, a genus of plants, of which there are only two species. 1. Ginger. 2. Broad-leaved, Wild Ginger, called *Zerumbet*.

The first, which is the common Ginger, is cultivated for sale in most of the islands in America, but is a native of the East-Indies, and also of some part of the West-Indies, where it is found growing naturally without culture

culture. The dried roots of this sort furnish a considerable export from the British colonies in America.

These roots are of great use in the kitchen, as also in medicine: and the green roots preserved as a sweetmeat, are preferable to every other sort. The roots of this sort are jointed, and spread in the ground; these put out many green reed-like stalks in the spring, which rise to the height of two feet and a half, with narrow leaves; the flower stems afterwards rise by the side of these, immediately from the root: these are naked, ending with an oblong scaly spike; from each of these scales is produced a single blue flower, whose petals are but little longer than the squamose covering.

The second sort grows naturally in India: the roots of this are much larger than those of the first, but are jointed in the same manner. The stalks grow from three to near four feet high with oblong leaves placed alternately; the flower stems rise immediately from the root; these are terminated by oblong, blunt, scaly theads; out of each scale is produced a single white flower, whose petals extend a considerable length beyond their scaly covering.

Culture of the GINGER.

They are easily propagated by parting of their roots; the best time for doing this is in the spring, before they put out new shoots, for they should not be transplanted in summer when they are in full vigour, nor do they succeed so well when they are removed in autumn, because they remain long after in an inactive state, and during that time, if wet comes to the roots, it often causes them to rot. When the roots are parted, they should not be divided into small pieces, especially if they are designed to have flowers; for until the roots have spread to the sides of the pots, they rarely put out flower-stems, for which reason they should not be planted in very large pots.

The pots with these roots should constantly remain plunged in the tan-bed; for if they are taken out and placed on shelves in the stove, their fibres frequently shrink, which often occasions the roots to decay.

GLADE, in agriculture, gardening, &c. a vista, or open and light passage made through a thick wood, grove, or the like, by lopping off the branches of trees along the way.

GLADWIN, a species of the Iris. See the article IRIS.

GLANS, a kind of fruit, contained in a smooth, hard bark, with but one seed, the hinder part covered with a sort of cup, and the fore part bare, as Acorns; it is properly the fruit without the cup.

GLASWORT, or *Shrubby GLASWORT*. This is a plant of no great beauty, therefore seldom admitted into gardens.

Culture of the GLASWORT.

It may be propagated by sowing the seeds in autumn; and if they are permitted to scatter their seeds when ripe, a new succession of plants will rise without any trouble.

GLASTENBURY-Thorn. See *Glastenbury-Thorn*.

GLOBE AMARANTH. See *EVERLASTING-FLOWER*.

GLUMA, or GLUME, a species of Calyx, consisting of two or three membranous valves, which are often pellucid at their edges. This kind of cup belongs to the grasses.

GOAT'S-BEARD, *Tragopogon*, a genus of plants, ranged by Linnæus among the *syngenesia polygamia*, and of which there are six species. 1. Goat's-Beard, with an empalement equal to the rays of the flower, and entire leaves; or common Goat's-Beard. 2. Goat's-Beard, with the empalement longer than the rays of the flower, and linear closed leaves; or small, yellow, meadow Goat's-Beard. 3. Goat's-Beard, with an empalement longer than the rays of the flower, entire closed leaves, and the foot-stalk thicker at the upper part, commonly called Salsafy. 4. Goat's-Beard, with an empalement longer than the rays of the flower, entire leaves, and smooth seeds, those of the disk being covered with a feathery down, and those on the borders bristly. 5. Goat's-Beard, with the empalement shorter than the rays of the flowers, narrow clouded leaves, and a hairy

stalk; or hairy Goat's-Beard. 6. Goat's-Beard, with prickly empalements, which are shorter than the petals, and arrow wing-pointed leaves.

The first sort is a native of Austria and Germany, where it grows naturally in the meadows. The stalk rises near three feet high. The leaves are three quarters of an inch broad at their base, and near a foot long, closed together, and ending in acute points. One large yellow flower terminates the stalk: this is composed of hermaphrodite florets which lie over each other like the scales of fishes, these are included in one common impalement which is equal in length to the rays of the flower. Each floret is succeeded by an oblong seed, which is larger at the base than at the point, where it is crowned with a large feathery down. The seeds of the border or ray are crooked and rough, but those of the disk are strait and smooth.

The second species grows naturally in moist pastures in many parts of England. It is often called *Go-to-bed-at-noon*, because the flowers commonly close every day at that time. The leaves are almost as long as those of the first sort, but are not more than a third part so broad; they are of a deep green colour, and end in acute points. The stalks rise about a foot high, and sustain one yellow flower at the top not more than half so large as those of the first.

When this sort is about four or five inches high, the country people gather it out of the fields, and boil it in the same way as Asparagus, and some give it the preference.

The third sort is cultivated in gardens by the title of Salsafy. The roots of this are dressed in different ways, and of late years it has, by some, been cultivated for the stalks, which are cut in the spring when they are four or five inches high, which are dressed in like manner as the second sort; and the stalks being much longer and tenderer than the former, are better for the purpose.

The leaves are broad, the flowers are large, and of a blue colour, and the footstalk immediately under the flower is much thicker than below.

The fourth sort is a native of Italy. The stalk seldom rises a foot high; the leaves are long and narrow, and the flowers are small, and of a very pale red.

The fifth species grows naturally in Istria, this has narrow hairy leaves. The stalks rise about a foot and a half high, are naked most part of their length, very hairy, and sustain one large yellow flower.

The sixth species is a native of Crete, and Italy. It is an annual plant very much resembling the Sow-thistle. It is seldom admitted into gardens, for the seeds being waisted by the winds to a great distance, and thereby filling the garden with their plants, soon renders it a troublesome weed.

Culture of the GOAT'S-BEARD.

These plants are propagated from seeds, which should be sown in April upon an open spot of ground, in rows about nine or ten inches distant, and when the plants are come up, they should be hoed out, leaving them about six inches asunder in the rows. Great care should be observed to keep them clean from weeds, which would soon overbear the plants, and spoil them.

This is all the culture they require, and if the soil be light and not too dry, the plants will have large roots before winter; at which time the Salsafy, whose roots are eaten at that season will be fit for use, and may be taken up at any time after their leaves begin to decay, for when they shoot again, they will be sticky, and not fit for use.

The common yellow sort, whose shoots are sold in the market, will be fit for use in April and May, according to the forwardness of the season. The best time to cut them is, when their stems are about four inches long, for when they are suffered to grow higher they are not good.

Some people in cultivating these plants sow their seeds in beds pretty close; and when they come up they transplant them out in rows at the before-mentioned distances; but, as they form tap-roots, which abound

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with a milky juice, when the extrem part of their root is broken by transplanting, they seldom thrive well afterwards; therefore it is by far the better way to make drills in the ground, and scatter the seeds therein, as before directed, whereby the rows will be at a due distance, and there will be nothing more to do than to hoe out the plants when they are too thick in the rows, which will be much less trouble than the other method of transplanting, and the plants will be much larger and fairer.

GOAT'S Rue. See Goat's RUE.

GOAT'S Thorn. See Goat's THORN.

GOLDEN-ROD, *Solidago*, a genus of plants ranged by Linnæus among the *syngenesia polygamia superflua*, and of which there are twenty-eight species.

1. Golden-rod with an erect angular stalk, flowers in clusters upon upright panicles, and the lower leaves spear-shaped. 2. Golden-rod with an erect paniced stalk, the lower leaves indented like saws, but those on the stalks almost entire. 3. Golden-rod with narrow spear-shaped leaves on the stalk almost entire, and flowers in clusters fitting close to the stalks. 4. Golden rod with narrow, spear-shaped, hoary leaves, and the stalk terminated by a corymbus of flowers. 5. Golden-rod with an erect stalk, spear-shaped leaves sharply sawed, and flower in a corymbus. 6. Golden-rod with a paniced corymbus, a recurved racemus, and rough sawed leaves with three veins. 7. Golden-rod with spear-shaped, sharp-pointed, sawed leaves, and footstalks with one flower. 8. Golden-rod with a paniced corymbus, a recurved racemus, and leaves almost entire, without veins. 9. Golden-rod with a paniced corymbus, a recurved racemus, and rough veined leaves. 10. Golden-rod with a flexible stalk, oval, sharp-pointed, sawed leaves, and simple racemus on the side of the stalk. 11. Golden-rod, with linear, entire leaves, and a simple corymbus. 12. Golden-rod with a flexible stalk, oval, spear-shaped, sawed leaves, and upright spikes of flowers. 13. Golden-rod, with an erect, smooth stalk, oval, spear-shaped, sawed leaves, and simple spikes of flowers on the side of the stalk. 14. Golden-rod, with a paniced corymbus, recurved spikes of flowers, a hairy stalk, and spear-shaped, sawed leaves, hoary on their under-side. 15. Golden-rod, with a paniced corymbus, recurved spikes of flowers, and spear-shaped, indented leaves, sitting close to the stalk. 16. Golden-rod, with oval, rough leaves on the stalk, alternate branches, and bundled spikes of flowers terminating the branches. 17. Golden-rod, with an oblique stalk, erect foot-stalks to the flowers, and entire spear-shaped leaves. 18. Golden-rod, with an erect panicated corymbus, a smooth stalk, and very long entire smooth leaves. 19. Golden-rod, with spear-shaped, fleshy, very smooth leaves, with rough edges, and a paniced corymbus of flowers. 20. Golden-rod, with an erect, smooth stalk, leaves sitting close, and simple erect spikes of flowers. 21. Golden-rod, with a paniced stalk, single lateral spikes of flowers, and rough, entire, spear-shaped leaves. 22. Golden-rod, with a paniced corymbus, the upper part of the spikes closer set with flowers, and a smooth stalk. 23. Golden-rod, with a paniced corymbus, recurved spikes of flowers, and the lower part of the stalk branching and flowering. 24. Golden-rod, with a paniced stalk, clustered spikes of flowers, lower leaves spear-shaped upon foot-stalks, and those upon the stalks smooth, and sitting close. 25. Golden-rod, with a paniced corymbus, very long recurved spikes of flowers, and rough, spear-shaped leaves. 26. Golden-rod, with a paniced stalk, erect foot-stalks to the flowers, and smooth, narrow, entire leaves. 27. Golden-rod, with a paniced stalk, erect spikes with flowers in clusters, and spear-shaped, rough, sawed leaves. 28. Golden-rod, with a paniced stalk, the spikes of flowers thinly disposed, the foot-stalks erect, the lower leaves spear-shaped and sawed, but those on the stalks obtuse, entire, and sitting close.

The five first species are natives of England, and never cultivated in gardens.

The sixth species grows naturally in Canada, and many other parts of North America. The stalks are three feet high. The leaves are entire, narrow, acute-pointed, a little rough on their surface, and sitting close to the stalk, which is terminated by a close panicle of yellow flowers, which makes an elegant appearance.

The seventh sort grows naturally on the Alps. The stalks seldom rise more than four or five inches high. The leaves are small and spear-shaped, and at their base is situated the foot-stalk of the flower, which is an inch long: it sustains one yellow flower at the top, which makes but little appearance.

The eighth species is a native of several parts of North America. The stalks of this rise higher than those of the sixth sort; the leaves are broader, without veins, and stand closer upon the stalks. The flowers are noble, of a bright yellow, and appear later in the year than those of the former.

The ninth species has strong, smooth stalks, about three feet high. The leaves are rough, veined, and entire, having no foot-stalks. The panicle of flowers is very compact, and the racemi are short.

The tenth sort has flexible stalks, about two feet high. The leaves are oval, acute-pointed, deeply sawed on their edges, and standing on short foot-stalks. The racemi of flowers are produced from the wings of the stalk, which is also terminated by a thick spike.

The eleventh sort is a native of the south of France, and of Italy. The stalks are near two feet high. The leaves are narrow, spear-shaped, and entire. Most part of the stalk is adorned with flowers, standing on long foot-stalks, which proceed from the wings.

The twelfth sort has a great resemblance of the tenth, but the leaves are smoother, more unequally sawed, and their foot-stalks are a little longer. The racemi of the flowers are also longer, and grow more erect.

The thirteenth sort has smooth, erect stalks, three or four feet high. The leaves are oval, spear-shaped, and sawed on their edges. The racemi of flowers are short, and come out on the side of the stalk.

The fourteenth species has hairy stalks, which rise four feet high. The leaves are long, spear-shaped, sawed on their edges, and downy on their under-side. The stalks are terminated by a large corymbus of flowers, composed of several reflexed racemi.

The fifteenth species has rough, hairy stalks, two feet high. The leaves are long, spear-shaped, and a little indented on their edges. The stalks are terminated by a large corymbus of flowers, composed of many long reflexed racemi.

The sixteenth species has rough, channelled stalks, which rise from two to three feet high: they are decorated with large, rough, oval leaves, and are terminated by bunches of yellow flowers, forming almost an umbel.

The seventeenth species is a native of Mexico. The stalks are smooth, and a foot and a half high. The leaves are smooth, spear-shaped, and entire. The flowers are situated on one side of the stalk, forming a small corymbus at the end of the foot-stalk.

The eighteenth sort has hairy stalks, which rise to the height of six, and sometimes seven feet. The leaves are smooth and spear-shaped. The stalk is terminated by a compact corymbus of flowers, ranged on short racemi.

The nineteenth sort rises with thick, succulent, smooth stalks, five feet high, decorated with smooth, fleshy, spear-shaped leaves, whose edges are rough. The flowers terminate the stalk in a corymbus; the racemi which compose it are erect, and below the flowers are closely garnished with linear smooth leaves.

The twentieth species has smooth, diffused stalks, three feet high. The leaves are very narrow and smooth. The upper part of the stalk sends out many long side branches, which are terminated by simple racemi of small yellow flowers, standing erect.

The twenty-first species sends out many slender hairy stalks, three feet high. The leaves are smooth, spear-shaped, rough, and entire. The upper part of the stalk

sends out on each side single racemi of bright yellow flowers. This sort flowers very late in the year.

The twenty-second species has slender smooth stalks, rising from two to three feet high. The leaves are smooth, spear-shaped, and a little notched on their edges. The stalk is terminated by a paniced corymbus of yellow flowers.

The twenty-third sort sends out at the bottom large oval leaves, sawed on their edges, whose foot-stalks are bordered by the appendix of the leaf. The stalks are slender, stiff, and of a purplish colour branching out in loose racemi of flowers, which are recurved, and decorated with smooth, spear-shaped, entire leaves.

The twenty-fourth sort has smooth erect stalks two feet high. The leaves are small, spear-shaped, and entire. The flowers terminate the stalk in a clustered corymbus, whose footstalks are erect.

The twenty-fifth species sends out strong smooth stalks two feet high. The leaves are rough, spear-shaped and indented on their edges. The upper part of the stalk divides into many slender branches, which are decorated with very small leaves, and are terminated by recurved racemi of bright yellow flowers.

The twenty-sixth sort sends out smooth paniced stalks two feet high. The leaves are linear, smooth, obtuse, entire, and set close to the stalk. The flowers terminate the stalk in loose panicles, standing erect.

The twenty-seventh sort has purplish stalks, which rise three feet high. The leaves are rough, spear-shaped, slightly sawed on their edges, and ending in acute points. The stalks are terminated by erect racemi of flowers, growing in clusters, of a bright yellow colour.

The twenty-eighth species has smooth, pale, green stalks which rise four feet high. The leaves are oblong, smooth, entire, blunt-pointed, and sit very close. The stalks are terminated by simple racemi, which are thinly disposed in a corymbus, but their footstalks are erect.

These species are most of them natives of North-America, and we have several varieties of them in our gardens.

Culture of the GOLDEN-ROD.

These plants are hardy and will thrive in almost any situation in our climate. They are easily propagated by parting of their roots; the best time for doing which is soon after the flowers decay, for those that are parted in the spring, will not be well established in the ground before they begin to put out their stalks, which will prevent their flowering strong, unless the summer is wet, or the plants duly watered, which is difficult to perform in a large plantation.

When the roots are well fixed in the ground, they may remain five or six years without transplanting; for if the ground about them is dug every winter, and such of the sorts as spread much at their roots are reduced so as to keep them within proper limits, they will, for that space, require no other culture. But when that time is expired it will be proper to take up the roots, which will then begin to decay in the middle of the bunch, therefore the off-sets should be taken off to plant, and the old decayed roots thrown away.

The plants may also be propagated by seeds, which should be sown soon after they are ripe, for then there is a greater certainty of their growing, and the plants will come up the spring following; whereas those which are sown in the spring, generally remain a year in the ground before the plants appear.

When the plants come up, and have strength enough to be removed, they may be planted in a shady border at six inches distance, where they should remain till the following autumn, at which time they should be transplanted to the places designed for them, and the summer following they will flower.

The seventeenth species is not so hardy as the others; it therefore requires a warmer situation.

These plants flower in autumn, when there is a scarcity of other sorts. They make an elegant appearance

in large gardens; for most of them spread so much at their roots, that they require more room than can be well spared in small ones. They are fittest for wood-walks, and to intermix with shrubs, where, if properly disposed, they will appear very ornamental.

Some of the species begin to flower in the middle of July, which are succeeded by others till the end of November; and, in favourable seasons, there are two or three sorts, which frequently continue in flower till Christmas, so that for near five months these plants will, in succession, adorn the garden.

GOLDEN-ROD-TREE, *Bosia*, a genus of plants ranged by Linnæus among the *pentandria digynia*, and of which there is only one species.

This plant is a native of the islands of the Canaries; and it has also been found in some of the British islands in America. It is a pretty strong woody shrub, growing with a stem as large as a middling person's leg; the branches come out very irregular, and make very considerable shoots in summer, which should be shortened every spring, when they fall away and new leaves are produced soon after.

Culture of the GOLDEN-ROD-TREE.

It is propagated by cuttings planted in the spring. The plants must be housed in the winter, being too tender to bear the open air of this country at that season. It does not appear that this shrub has ever flowered in England.

GOLD OF PLEASURE, a species of *Myagrüm*.

This plant grows naturally in corn fields in the south of France and in Italy, it is an annual, and rises with an upright stalk about a foot and a half high, sending out two or four side branches, which grow erect. The lower leaves are of a pale green, and are eared at their base; those upon the stalks diminish in their size all the way up they are entire and almost embrace the stalks with their base. The flowers grow in loose spikes at the ends of the branches, standing upon footstalks an inch long: they are composed of four small yellowish petals, placed in form of a cross.

Culture of the GOLD OF PLEASURE.

This plant flowers in June and July, and the seeds ripen in September; which, if permitted to scatter, the plants will rise without any care. They only require to be thinned and kept clean from weeds.

GOLDYLOCKS, *Chrysocoma*, a genus of plants ranged by Linnæus among the *syngenesia polygamia aequalis*, and of which there are five species. 1. Herbaceous Goldylocks with narrow smooth leaves, and loose impalements. 2. Herbaceous Goldylocks with flowers growing in panicles, spear-shaped leaves, having three nerves. 3. Shrubby Goldylocks with very narrow leaves, whose back parts run along the stalks. 4. Shrubby Goldylocks with very narrow leaves, which are hairy on their under-side, and flowers nodding before they are blown. 5. Shrubby Goldylocks with narrow rough leaves which are recurved and hairy, and erect flowers.

The first species grows naturally in Germany, and also in France and Italy; it has a perennial root and an annual stalk, which rises about a foot and a half high, round and stiff. The leaves are long, smooth, narrow, and are placed without any order. The upper part of the stalk divides into many slender footstalks, each sustaining a single head of flowers, of a bright yellow.

The second sort grows naturally in Siberia. It has a perennial creeping root whereby it propagates too fast to be admitted into the flower-garden, for it often extends two or three feet every way, in the space of one year, but, as it will grow in any soil or situation, it may be planted in the side of extensive rural walks round the borders of fields, where they will require no care, and their loose panicles of yellow flowers, will make an agreeable appearance, as they continue a long time in beauty.

The third species is a native of the Cape of Good Hope. It has a ligneous stalk which rises about a foot high, and divides into many smaller branches. The leaves

leaves are narrow and of a deep green. The flowers are produced at the ends of the branches, on slender naked footstalks. Their colour is a bright yellow.

The fourth species is a native of the Cape of Good Hope. This plant has a branching shrubby stalk, which rises about a foot high. The leaves are shorter than those of the former sort, and a little hairy. The flowers are not half so large, they are of a pale sulphur colour, and nod on one side before they are blown.

The sixth species is also a native of the Cape. This has a low shrubby stalk which seldom rises above six inches high, branching out on every side. The leaves are very narrow, short, rough, and reflexed. The flowers stand single on the top of the footstalks, which arise from the upper part of the branches; these flowers are larger than those of the last, and stand erect.

Culture of the GOLDYLOCKS.

The first species is generally propagated by parting of the roots; the best time for doing this is in autumn soon after the plants decay. It delights in a dry loose soil, in which it will live in the open air, and propagate by its roots very fast; but in strong wet land, the roots often rot in winter.

The third, fourth, and fifth species may be propagated by seeds which should be sown in autumn on a common border of light earth. In spring the plants will come up, when they should be transplanted into pots, and sheltered in the winter. But the most expeditious method of propagating them is by cuttings, which if planted in a common border in any of the summer months, and covered with hand-glasses will take root. They should be shaded from the sun, and gently watered. When they have got good roots, they should be carefully taken up, and each planted in a separate pot filled with light earth, and placed in the shade till the plants have taken root, after which they may be exposed with other exotics till autumn, and then removed into the green-house during the winter season.

GOLDYLOCKS. See **CUDWEED**.

All GOOD, or GOOD HENRY, a species of Goosefoot. See the article **GOOSEFOOT**.

GOOSBERRY-BUSH, *Grosularia*, a distinct genus of plants according to all botanists except Linnæus, who considers it as a species of the *Ribes*, and ranges it among the *monogynia pentandria*.

Culture of the GOOSBERRY-BUSH.

It is propagated either by suckers taken from the old plants, or by cuttings. These last are by far preferable, because they generally root the best, and are least apt to produce suckers, which always weaken the stock from whence they proceed. The cuttings should be taken from the handsomest shoots of the best bearing branches of the most fruitful shrubs: they should be about six or eight inches long, and should be taken off, and planted, in autumn, just before their leaves begin to fall, about three inches deep, in light earth, exposed to the morning sun. Their growth will be promoted by watering of them gently in dry weather, and they will be trained up regularly to a strait stem, if all their under shoots are rubbed off in the summer, as soon as they appear, so as to leave only the uppermost or strongest. In the next October, these plants will be fit to remove into a nursery, where, after trimming their roots, and cutting off all side branches, they should be set a foot asunder in rows three feet distant from each other, in an open spot of fresh earth, which has been well dug, and cleansed from all noxious weeds and roots. They should here be fastened to short sticks, or stakes, the more effectually to render their stems strait and upright; they should be cleared from all lateral shoots to the height of about a foot above the surface of the earth; and after one year's training in this manner (keeping them clear from weeds, and cutting out all cross branches, so that their heads may not become too thick,) they will be fit to transplant to the places where they are to remain. The soil, for them to thrive to the greatest advantage, should then be a rich light sandy earth; though they will do very well in middling soils which are not too strong or moist, and in all situations. However, their fruit is best when they grow in an open exposure, and not within the

shade of other trees. The best season for this transplanting is likewise in October, when their leaves begin to decay; and it will also be right then to trim their roots again, to divest them of all lateral and all cross shoots, and to shorten all their long branches, so as to make the head regular. The distance at which they should be planted now, if there be a large number of them, is eight feet row from row, and six feet asunder in the rows.

The gardeners around London, who raise great quantities of these bushes in order to supply the markets with their fruit, prune them soon after Michaelmas, and then dig up the ground in the above-mentioned intermediate spaces, and plant it with Coleworts for spring use. Their ground is by this means employed all the winter, without hurting the Goosberries; and the Coleworts so planted often escape in hard frosts, when others which are less sheltered are often destroyed. This husbandry is well worth practising where land is dear, or where persons are confined for room.

The common practice of clipping the heads of these shrubs with shears, in order to give them a roundish form, is very wrong: because they become thereby so crowded with wood, that the fruit which they produce never grows then to half the size that it would if the branches were properly thinned with a pruning knife, all the misplaced ones cut away, and the strong bearing shoots shortened to about ten inches, with care always to prune them off behind a leaf bud. With this management, with keeping the ground clear from weeds, with digging it at least once a year, and with bestowing a little rotten dung upon it every other year, the fruit will be near twice as large as that which is raised in the common way, and the shrubs will continue in vigour much longer.

The large white Dutch, the large Amber, the early red, and the early green, both of which last are hairy, are generally reckoned the best sorts of Goosberries: but many others, known by the names of the persons who first raised them from seeds, are also much esteemed.

Goosberries yield in plenty an agreeable and cooling liquor, the first lusciousness of which is soon carried off by proper fermentation. Some make Goosberry-wine without boiling it at all, because the boiling gives it a brownish colour: but the truth is, that it will soon become sour, if it be not depurated from the gross ley, with which it abounds, by a proper fermentation.

GOOSBERRY, *Pereeskia*, a genus of plants, of which there is but one species.

This plant is a native of the warmer parts of South America. It has many slender branches, which if not supported, will trail on the ground. The branches and stem of the plant are full of whitish spines, which are produced in tufts. The leaves are roundish, very thick, and succulent, and the fruit is about the size of a Walnut, having tufts of small leaves on it, and has a whitish mucilaginous pulp.

Culture of the GOOSBERRY.

It may be propagated by planting of the cuttings during any of the summer months, which should be set in pots filled with fresh light earth, and plunged into a moderate hot-bed of tanners bark, observing to shade them from the sun in the heat of the day. In about two months the cuttings will have made good roots, when they may be carefully taken out of the pots, and each planted in a separate pot, and plunged into the hot-bed again, where they may remain during the summer season; but at Michaelmas, when the nights begin to be cold, they should be removed into the stove, and plunged into the bark-bed. During the winter season the plants must be kept warm; in summer they must have a large share of air, but they should constantly remain in the stove: for though they will bear the open air in summer, in a warm situation, yet they will make no progress if they are placed abroad; nor do they thrive near so well in a dry-stove, as when they are plunged in at the back of the tan-bed, to which their branches may be fastened, to prevent their trailing on other plants.

GOOSE-FOOT, or WILD ORACH, *Chenopodium* a genus of plants, ranged by Linnæus among the *pentandria digynia*, and of which he enumerates twenty-two species.

species, but seven of them only are admitted into gardens, the rest growing wild in this country. 1. Goose-foot, with triangular, arrow-shaped, entire leaves, called English Mercury, All Good, or Good Henry. 2. Goose-foot, with oblong, sinuated leaves, and naked, multifid bunches of flowers, commonly called Oak of Jerusalem. 3. Goose-foot, with spear shaped, indented leaves, and single leafy bunches of flowers, commonly called Oak of Cappadocia. 4. Goose-foot, with intire, oval, rhomboidal leaves, and flowers growing in clusters; or Stinking Orach. 5. Goose-foot, with narrow, spear-shaped, plane and intire leaves, commonly called Belvedere, or Summer Cypress. 6. Goose-foot, with narrow, taper, fleshy leaves, and a shrubby stalk, called Stone Crop-tree, or Shrubby Glaswort. 7. Goose-foot, with spear-shaped, indented leaves, and a shrubby stalk, called Shrubby Mexican Orach.

The first species is found growing in shady lanes in many parts of England; it used formerly to be cultivated in gardens, and dressed in the same manner as Spinach; but as the latter is a much better herb, it has justly obtained the preference.

The second sort is a native of North America. It sends up several stalks from the root, which rise about two feet high. The leaves are oblong, a little indented on their edges, of a light green, and placed alternately on the stalks. The flowers are situated on the upper part of the branches, in loose spikes: these appear in July, and the seeds ripen in September.

The leaves of this plant emit a very strong odoriferous scent when bruised, for which the plants are preserved in gardens, for the flower has no beauty.

The third species is a native of North America, and of many of the warm countries in Europe. It has many oblong leaves at the bottom, which are deeply sinuated on both sides; they are purple on their under side, and when bruised, emit a strong odour. The stalks rise about eight or nine inches high, dividing into several smaller branches. The leaves are of the same shape as those below, but are smaller. The flowers grow in naked, loose spikes, divided into many parts; these appear in June and July, and the seeds ripen in autumn.

The fourth species is very common in most parts of England, and is seldom cultivated, except in some physic gardens.

For the fifth species of this genus, commonly called Summer Cypress, see the article *SUMMER-CYPRESS*.

The sixth species grows naturally on the sea-coast in Devonshire and Cornwall, but is propagated in the nurseries for sale. It sends out from the root many slender, shrubby stalks, which rise five or six feet high, and divide upward into small ligneous branches, which grow erect. The leaves are small, taper, and succulent; they remain all the year, for which the shrub is chiefly valued, for the flowers are small and have no beauty.

The seventh sort has leaves very like those of the second, and have the same scent; but it has a shrubby stalk, which rises five or six feet high, and divides into many branches. It is a native of America, and will not live through the winter in the open air of our climate.

Culture of the Goose-foot.

The first, second, third, and fourth species, may be propagated by sowing the seeds in autumn; and if they are permitted to scatter their seeds, a new succession of plants will rise without any trouble.

The sixth sort is propagated by suckers, which it sends out from the roots in plenty. It may be transplanted either in spring or autumn, and will thrive almost any where.

The seventh sort is easily propagated by cuttings, during any of the summer months, which if planted in a shady border and duly watered, will soon take root, and then may be planted in pots, and placed with other hardy exotic plants in a sheltered situation during summer; and when the frosts come on, they must be removed into the green-house, but they only require protection from hard frosts, so must have plenty of air in mild weather.

GORSE. See the article *FURZ*.

GO-TO-BED-AT-NOON, a species of Goat's-beard. See *GOAT'S-BEARD*.

GOURD, *Cucurbita*, a genus of plants, ranged by Linnæus among the *monoecia syngenesia*, and of which there are four species. 1. Gourd, with angular woolly leaves, a glandulous base, and a woody fruit; or the Greater Bottle Gourd, commonly called Long Gourd. 2. Gourd, with lobated leaves, and a smooth fruit; or the Pepo, commonly called the Pompion, or Pumpkin. 3. Gourd, with lobated leaves, and a warted, knotty fruit, commonly called the Warted Gourd. 4. Gourd, with lobated leaves, an erect stalk, and a depressed, knotty fruit, or the Melopepo, commonly called Squash.

These are all annual plants and natives of North America. They are cultivated in the English gardens by way of curiosity, for the fruit is seldom eat here, though if they are gathered when young, and boiled, they have an agreeable flavour.

Culture of the Gourd.

All these species are propagated by sowing the seeds in April upon a hot bed. When the plants are come up, let them be transplanted into a more moderate bed, where they should have a great deal of air; and when they have got four or five leaves, let them be removed into an old dunghill, or some such place, where they may have room to run, as some of the sorts will spread to a great distance.

Sour GOURD, or **MONKIES BREAD**, *Adansonia*, a genus of plants, of which there is only one species.

This tree is supposed to be a native of the West-Indies, and its stem is of a prodigious size. The leaves of the young plants are entire, of an oblong form, about four or five inches long, and almost three broad towards the top, where they are broadest, having several veins running from the middle rib; they are of a lucid green, and stand alternately.

As the plants advance in height, the leaves alter, and are divided into three parts, and afterwards into five lobes, which spread out in the shape of an hand. The fruit is almost as large as a man's head, the shell is woody and close, having a greenish, downy coat: and it is divided into ten, twelve, or fourteen cells within, which contain a great number of kidney-shaped seeds, as large as the tip of a man's little finger; these are closely surrounded with a mealy pulp, of an acid taste.

Culture of the Sour Gourd.

The plants rise easily from fresh seeds, if they are sown in a hot-bed, and are of quick growth for two or three years, but afterwards make but little progress; the lower part of their stems then begin to swell and grow much larger than the other part, after which they do not advance much in their upright growth, but put out lateral branches, which incline to an horizontal position; the branches are covered with a light grey bark.

The leaves fall off in the latter part of winter, and the young leaves do not come out till summer, so the branches are naked for near three months.

As this tree is a native of very hot countries, the plants will not thrive in the open air in England, in summer; therefore they must be constantly kept plunged in the bark-bed in the stove, and in warm weather the fresh air should be admitted to them every day; but in the winter they must be kept warm; while the plants are in a growing state, they must be frequently refreshed with water, but when they are destitute of leaves, it must be given sparingly, for too much wet will then rot their roots. It loves a light, rich, loamy soil.

GRAFT, or **GRAFF**, in gardening, a cion or shoot of a tree inserted into another, so as make it yield fruit of the same nature with that of the tree from whence the graft was taken. See the following article.

GRAFTING, or **ENGRAFTING**, is the taking a shoot from one tree, and inserting it into another, in such manner as that both may unite and become one tree.

The first thing necessary to be done is to collect the grafts. In the choice of these the following directions should be carefully observed: First, That they are shoots of

of the former year. Secondly, That they are taken from healthy fruitful trees. And, thirdly, That you prefer those grafts which are taken from the lateral or horizontal branches, to those taken from the perpendicular shoots. These grafts should be cut off from the trees before the buds begin to swell, which is generally three weeks or a month before the season for grafting; therefore when they are cut off, they should be laid in the ground with the cut downwards, burying them half their length, and covering their tops with dry litter, to prevent their drying: if a small joint of the former year's wood be cut off with the cion, it will preserve it the better: and when it is grafted, this may be cut off; for the grafts never must be cut to a proper length before they are inserted into the stocks; but till then, the shoots should remain their full length, as they were taken from the tree, which will preserve them better from striking. If these grafts are to be carried to a considerable distance, it will be proper to put their cut ends into a lump of clay, and to wrap them up in moss, which will preserve them fresh for a month or longer; but these should be cut off earlier from the trees than those which are to be grafted near the place where the trees are growing.

The reason for grafting is, that as all good fruits have been accidentally obtained from seeds, so these when sown will often degenerate, and produce such fruit as are not worth cultivating; but when the shoots, cions, or grafts, are taken from such trees as yield good fruit, these will never vary from their kind, whatever be the stock or tree on which they are grafted.

The most proper season for grafting is the spring, just before the rising of the sap, or at least before it rises in any great quantity: but the weather must be neither frosty nor wet; nor should the wind blow very bleak or strong when this operation is performed; for on these circumstances, and upon the exact joining of the inner bark of the cion with the inner bark of the stock, so that the sap which flows between the bark and the wood may be communicated from the one to the other, the success of grafting chiefly depends.

The implements necessary for grafting are, fine small hand-saws to cut off the heads of large stocks; a good strong knife with a thick back to make clefts in the stocks; a sharp penknife to cut the grafts; a grafting chissel, and a small mallet to pare away the wood; bass, or woollen yarn, to tie the grafts with; and a quantity of clay, or cement, properly prepared, to lay over the incisions, in order to prevent their bleeding, and keep out the air.

The method of preparing the clay intended for this purpose, is to mix thoroughly together a quantity of strong fat loam, some new stone-horse dung broken into small bits, a little tanner's hair, or straw, cut very small, with a little salt, and as much water as will make the whole of the consistence of pretty stiff mortar.

The cement or composition which some have of late used, and which has been found to answer the design of keeping out the air better than the above clay, is made of turpentine, bees-wax, and rosin, melted together. This composition, when of a proper consistence, is laid about a quarter of an inch thick, upon the cut part of the stock round the graft: and has this farther advantage over the clay, that there is no danger of its being hurt by frost; for cold hardens it; and when the heat of summer comes on, by which time it is no longer wanted on the tree, it will melt and fall off without any trouble.

Among the several methods of grafting hitherto known, the following are most approved, and generally practised.

Cleft-GRAFTING, called also Stock, or Slit-GRAFTING.

This is used chiefly for middle sized stocks, from one to two inches in diameter. The season for it is in the months of February and March; and the method, as now practised, is this:

The head of the stalk being sawn, or cut off, with a slope, smooth and clean, a perpendicular cleft is made

therein, about two inches deep, with a strong knife, or chissel, from the top of the slope, as near to the pith as may be without touching it. In this cleft, the grafting chissel, or a wedge, is put to keep it open. The graft or cion is prepared by cutting it aslope, in form of a wedge, to suit the cleft, only leaving a small shoulder on each side; and when cut, it is to be placed exactly in the cleft, so as that the inner bark of the cion may aptly, and closely, join to the inner part of the bark, or rind of the stock; in the dexterous performance of which, the chief part of the art of grafting consists. That side of the cion which is to be placed outward, at the part where it is cut wedge-wise and inserted into the cleft of the stock, should be much thicker than the other side, the better to facilitate the exact joining of its rind to that of the stock; for if these two do not unite, the graft will not succeed. The rind of the stock chosen for this way of grafting should therefore not be too thick; because it will then be the less manageable. If the cleft pinch too tight, a small wedge may be left in it to bear the stress. As soon as the graft is properly fixed, the cleft should be closely covered over with clay, or, which some think better, with moss, or the fresh bark of a tree bound on with ozier.

When this method, which is the most ancient, and most common, manner of grafting, is used to stocks that are not strong, a ligature of bass should be made around the stock, to prevent the opening of its slit; and the whole should then be clayed over, or covered with the cement before described, to hinder the air from penetrating into the slit, so as to destroy the graft, only two eyes of which should here be left above the clay, for shooting.

The straightest and smoothest part of the stock should always be preferred for grafting, in whatever way this operation is performed.

GRAFTING in the Rind, or Shoulder-GRAFTING.

This is likewise called slicing and packing, to distinguish it from grafting in the bark, which will next be spoken of: it is performed in the following manner, about the latter end of March, or the beginning of April, on more slender stocks than those which are commonly used for cleft-grafting.

The top of the stock is cut off in a smooth, straight place: then the cion, or graft, is prepared by cutting it on one side from the joint, or seam, down slope-wise, making the slope about an inch, or an inch and a half long; and observing it is bent, so that the cion may stand nearly upright when it is fixed to the stock. At the top of the slope a shoulder is made, whereby it is to rest on the crown of the stock. The whole slope must be plain and smooth, that it may lie even to the side of the stock. The length of the cion used here may be about four inches from the shoulder, for a standard tree; but for a dwarf, or wall-tree, it may be six inches. When the cion is prepared, the outside of its sloped end, from the shoulder downward, is applied to the west, or south-west side of the stock, and its length and breadth measured thereon; which done, the bark of the stock (but not any of its wood) is cut away to those dimensions, that the cut part of the cion may be fitted in as exactly as possible. In doing this, regard must be had to the bigness of the stock, and the thickness of its bark, in order to proportion thereto the length and breadth of the cut part of the cion; otherwise the passages of the sap in the stock and cion will not meet, and the cion will then of course perish. When the cut part of the cion is exactly fitted to, and laid on that of the stock, they are bound together with woollen yarn, and covered with clay an inch above, and as far below, the head of the stock; working it round the cion, till it becomes sharp at top, that the rain may run down it.

This method has several advantages over the former. Among these are, that the wound heals up sooner, and that, in the mean time, it is in less danger from the weather: that it does less injury to the stocks and grafts, by avoiding all severe splittings and pinchings; that the bark is more easily placed in the passage of the sap here, than in the cleft; that the graft thrives and shoots with greater

vigour, and bears sooner in this way than in that; and that it is practicable on smaller stocks than the other, which must have a good body, and consistence, before they can bear cleaving.

Grafting in the Bark.

This operation is performed thus. Prepare the stock and cion as for grafting in the rind, both as to time and manner; but, instead of cutting out the bark of the stock, slit it down, on the south-west side, from the top, almost as long as the sloped part of the cion, and at the top of the slit loosen the bark with the point of your knife. Then thrust an instrument, made of very hard wood, ivory, silver, or the like, and formed at the end like the slope-end of the cion, but much less, down between the bark and wood, to make room for the cion; which being put in, the bark is to be so managed, as that it may close exactly to the stock and edges of the cion, and the whole is then to be bound up, and covered as before.

Whip-Grafting, or Tongue-Grafting.

This is proper for small stocks, from an inch diameter to a quarter of an inch, or even less. Mr. Worlidge, Mr. London, Mr. Miller, and others, speak of it as the most effectual way of any, and that which is most in use, because the cion covers the stock much sooner in this method than in any other; for here the cion and the stock must always be of the same thickness. There are three ways of performing it, and all of them may be practised somewhat later than either of the foregoing.

The first is, to slope the cion off a full inch or more; then to do the same to the stock; and afterwards to tie the one to the other, with bafs or yarn, so as to join them closely at every part, but particularly at the rind; and then to cover the joint carefully with well-tempered clay. The bafs used for this, or for any other binding, should be taken from a sound mat, and be soaked in water for some hours, to increase its strength, and render it the more pliable.

The second way is, to make a shoulder in the graft, and, the head of the stock being cut off and smoothed, to join it as in grafting in the rind.

The third method, which is an improvement of the last, is properly named tipping or tonguing. This is done by cutting the stock off slanting, as before, and leaving at its upper side a thin piece, or tongue, as it is called, of the wood, pared away like the lower end of a cion. The cion is then sloped, and tongued, in the same manner as the stock, and a slit is made in each of them, downward in the stock, and upward in the graft, on the side opposite to the tongue, so that each may receive the tongue of the other. The cion is then joined to the stock, as closely as can be, particularly at the bark; a ligature is made round them with bafs or woollen yarn, and the engrafted part is well covered with clay or cement.

Side Grafting.

In this, the cion is prepared as in whip-grafting; but the head of the stock is not cut off at the time of performing the operation. Instead of that, so much of the bark as the cion will cover is pared off from the west-side of the stock; then both the cion and the stock are slit in the last mentioned manner of whip-grafting, and they are bound together, and closed up with clay. At the year's end, the top of the stock is cut off at the grafted place, slope-wise; and the wound is covered with clay or cement.

Crown-Grafting.

This is only practised in the larger trees, which are capable of receiving a number of grafts, and are too big to be cloven; for these, the head or main branches, being cut off horizontally, four or more grafts are placed round the stock, between the bark and the rind, somewhat in the manner of a crown. The most proper time for performing this is about the latter end of March, or the beginning of April. After the intended number of cions are inserted, which is done exactly in the same manner as that already delivered for grafting in the rind,

the whole crown of the stock is well clayed over, and only two eyes of each cion are left uncovered; that being sufficient for their shooting.

This method of grafting was more practised formerly than it is at present; many people having been discouraged by the ill success that has frequently attended their cions, which have been blown out of the stock, by strong winds, after they had made large shoots, and even after they had grown there five or six years. But this accident may be prevented, by tying the cions to stakes fastened to the tree, till they are so firmly fixed, as to have almost covered the stock.

Root-Grafting.

This is a modern invention, the design of which is somewhat different from that of any of the former methods; this being for the propagation, or multiplication, of plants already fitted to produce their fruit.

To perform this, take a graft, or sprig, of a young tree, which you intend to propagate, and a small piece of the root of another tree of the same kind, or of a like genus, and whip-graft them together; observing that the but-ends of the graft and root be well united, and that the rind of the root join closely to that of the graft. These may, afterwards, be planted out at pleasure, and the piece of root will collect the nutritive juices, and feed the graft, as the stock does the other way.

This method of propagation is very easy and expeditious; roots being more plentiful than stocks: by this means the pieces of roots of one crab-stock, for example, or of one apple-stock, will serve for twenty or thirty apple grafts; and the like of other trees. It is also an excellent way for raising of tender trees, which will hardly bear being grafted in the stock. Add, that trees thus grafted bear sooner, and are more easily dwarfed than those done any other way.

The only objection against this method is, that the young tree grows but slowly at first, which is occasioned by the smallness of the root that feeds the graft; for in all trees the head must follow the increase of the roots, from whence it has its nourishment.

Reiterated-Grafting, or Grafting by a double or triple incision.

This is another method mentioned by Agricola, whose work, though chimerical enough in many respects, contains, notwithstanding, several good things. To perform this, first graft a good cion on a stock, and cut it away to one half, or a third part; then fix to that remaining part of the cion another graft of a better kind; and to that a third; for the oftener the tree is grafted, the finer fruit it produces.

By this method the author above-mentioned assures us, that he produced muscat pears, which were admirable, making at first use of a stock grafted with a pound-pear, on which he grafted a summer bon-cretien; and when the branch of this last had shot, he grafted on it a cion of a bergamot, which he also cut, and grafted on it a cion of a muscat pear.

Grafting of Branches.

This is also commended by Agricola, as a very certain and profitable operation; best practised on large, or full-grown, and even old trees.

To do this, half or more of the branches must be lopped off, and grafts of three or four years old be applied to them, taking care to have stakes, or other things, to support them against the wind, &c.

He adds, that by this method you will have, perhaps, the same year, or at least the second or third, such a quantity of fruit, as the youngest and soundest tree would hardly produce.

Grafting by approach, called also Inarching, and Ablatation.

This is used only when the tree intended to be grafted, and that from which the graft is to be taken, stand so near, or can be brought so near to each other, that they may be joined together. The method of performing it is this: the branch to be inarched is fitted to that part of the

the stock where it is to be joined; the rind, and part of the wood, of one side of that branch, is then pared away, very smooth and even for the length of three inches; and afterwards the other branch, which is to serve for the stock to which the graft is to be united, is served in the same manner, so that the two may join closely and equally together, that the sap vessels may meet. A little tongue is then cut upwards in the graft, and a slit is made in the stock to receive it; so that when they are joined, the tongue prevents their slipping, and the graft is the more closely united to the stock. When they are thus placed exactly together, they must be tied with bafs, worsted, or some other soft thing; and the place of junction must be well covered over with grafting clay, to prevent the air from drying the wound, and the wet from rotting the stock. A stake must also be fixed in the ground, and both the stock and the graft must be tied thereto, to prevent their being displaced by the wind. When they have remained in this state four months, they will be sufficiently united, and the graft may then be cut off from the mother-tree, observing to slope it close to the stock. It is of great service to the graft then to lay a fresh coat of clay all round the grafted or joined part. This operation should be performed in April or May, that the graft may be perfectly united to the stock, before the ensuing winter. It is chiefly practised upon Oranges, Myrtles, Jasmines, Firs, Pines, and some other trees, which do not succeed well in the common way of grafting or budding. But though Orange-trees are here mentioned among the rest, this practice is not to be advised for them, or for any other trees, if they are intended to grow large; for that they hardly ever do in this method; and accordingly it is seldom used but for the curiosity of having a young plant with fruit upon it, in a year or two from its having been raised from the seed. This is, indeed, effected by inarching a bearing branch into a young stock: but the plant so treated seldom lives long.

The Walnut, Fig, and Mulberry, will also take by this method of grafting, though neither of them will succeed in any other way; but still they, like all other trees that are thus managed, will remain weak, and stunted in their growth, besides the shortening of their otherwise usual time of duration.

All grafts, particularly of young cions, are subject to be injured by birds: but that may be prevented by binding some small bushes about the tops of the stocks.

The binding of the grafts, whether it be of bafs or yarn, should be loosened at least, if it be not entirely taken off at midsummer, or thereabout, lest its then too great tightness (as the stock will have increased in bulk, and the binding, perhaps, have been swelled, and consequently shrunk by the weather) should injure the plant.

Escutcheon GRAFTING. See the article INOCULATION.

GRAPE, the fruit of the Vine. See VINE.

Sea-Side, or *Mountain* GRAPE, *Coccoloba*, a genus of plants, of which there are six species. 1. *Sea-side* Grape, with round, thick leaves, which are open at the base. 2. *Sea-side* Grape, with oblong, heart-shaped leaves, and a tree-like stalk, terminated by long bunches of fruit. 3. *Sea-side* Grape, with heart-shaped oval leaves, and the bunches terminated by long bunches of fruit. 4. *Sea-side* Grape, with target, heart-shaped leaves. 5. *Sea-side* Grape, with spear-shaped, veined leaves, and a small spotted fruit, called *Chequered* Grape in America. 6. Grape, with oval, spear-shaped leaves, ending in acute points, and a tree-like stalk.

The first sort grows naturally in most of the islands in the West-Indies, upon the sandy sea-shores, from whence the inhabitants have given it the title of *Sea-side*, or *Mangrove* Grape; this sends up several woody stalks from the root, which rise eight or ten feet high, with a light brown, smooth bark, garnished with leaves, which are placed alternately: they are very thick and stiff, almost round, from five to seven inches diameter, of a lucid green on their upper side, and veined on their under, standing upon short foot-stalks. The flowers

come out from the wings of the stalks: they are disposed along the foot-stalks in long slender bunches, like those of the common Currant: these bunches are five or six inches long; the flowers are white, and the petal is cut into six parts: these are succeeded by berries, about the size of a common Grape, of a purplish red colour, inclosing a nut of the same shape.

The second sort grows naturally about Carthage: this sends out many strong stalks from the root, which rise near twenty feet high, and are covered with a smooth grey bark. The leaves are from seven to nine inches long, and from three to four broad; they are indented at the foot-stalk like a heart, but end in a point, having several transverse veins running alternately from the midrib to the border, of a thick, stiff consistence, and of a lucid green on their upper side. The flowers are produced in long slender bunches at the end of the branches; they are composed of five white, acute-pointed petals, which spread open in form of a star: these are succeeded by roundish, purple fruit, smaller than those of the former sort, and not so well flavoured.

The third sort grows naturally at La Vera Cruz, in New Spain; this sends many shrubby stalks from the root, which rise five or six feet high, having a light grey bark. The leaves are oval and heart shaped, three inches long, and two and a half broad, indented at their foot-stalks: these are not so stiff as those of the two former sorts. The fruit is disposed in a slender bunch at the end of the branches: they are small and of a dark purple colour, and are never eaten by the inhabitants.

The fourth sort is a native of Campeachy: this sends up many slender ligneous stalks from the root, which rise to the height of seven or eight feet, covered with a grey bark, garnished with heart-shaped leaves, about four inches long, and three broad, whose foot-stalks are joined to the under part of the leaves, like the handle of a target. The leaves are of a lucid green, and smooth on their upper side.

The fifth sort grows naturally in Jamaica: this sends up many slender ligneous stalks from the root, which rise four or five feet high, covered with a brown bark. The leaves are six inches long and three broad, having many strong veins running from the midrib towards the border: they are of a light green colour, and are not so stiff as the former. The fruit is small, of a purple colour, growing in slender bunches from the end of the branches.

The sixth sort grows naturally on the north-side of the island of Jamaica, upon the mountains, so is generally there called the *Mountain* Grape: this sort grows to a large size, and is esteemed for its wood, which is ranked among their best sort of timber. The trunk of this tree grows to the size of a man's body: it rises to the height of thirty feet, sending out side branches, which are garnished with oval, spear-shaped leaves, ending in acute points: they are six inches long, and two and a half broad toward their base, of a bright green on their upper side, but are pale on their under, of a thick consistence, and stand upon short foot-stalks. The fruit of this is produced on long slender foot-stalks: they are of a purplish colour, and are almost as large as those of the first sort.

Culture of the Sea-side GRAPE.

These plants rise easily from seeds, if they are sown in pots, and plunged into a hot-bed of tan: but as they do not produce fruit in England, the seeds must be procured from the West-Indies.

When the plants are come up about two or three inches high, they should be each transplanted into a separate small pot, and plunged into a fresh hot-bed of tan, where they must be shaded from the sun, until they have taken new root; after which they must be treated in the same manner as other tender exotics, giving them a proper share of air in warm weather, and gently refreshing them with water: but they should not have too much wet, for they do not perspire much, their leaves being of a very close contexture, especially those of the first and second sorts. In autumn these plants should be removed into the hot-house, and plunged into the bark-bed,

bed, otherwise they will not make great progress; therefore they should always remain in the tan-bed, giving them plenty of air in summer. The leaves of these plants continue in verdure all the year, so make a fine appearance in the hot-house in winter.

GRASS-WALKS, and GRASS-PLATS, are generally made by laying turfs, taken from a fine common or down, it being esteemed a much better method than that of sowing Grass-seed, but if walks or plats are to be made by sowing, the best way is to procure the seed from those pastures, where the Grass is naturally fine and clear, or else the trouble of keeping it from spiry or benty Grass, will be very great, and it will scarce ever look handsome.

In order to sow Grass-walks, the ground must be first dug: and when it has first been dressed and laid even, it must be very carefully raked over, and all the clods and stones taken off, and then covered over an inch thick with good mould; this being done, the seed is to be sown pretty thick, that it may come up close and short: it must then be raked over again to cover the seed, that if the weather should happen to be windy, it may not be blown away. It ought also to be observed, that where Grass is sown in gardens, either for lawns or walks, there should always be a good quantity of the white Trefoil, or Dutch Clover sown with it; for this will make a fine turf much sooner than any other sown Grass, and will continue a better verdure than any of the Grass tribe.

In order to keep Grass-plats or walks handsome, and in good order, you may sow in autumn, fresh seed, over any places that are not well filled, or where the grass is dead: but nothing improves Grass so much, as mowing and constantly rolling.

When turf is laid in gardens, it is a general practice to cover the surface of the ground under the turf, either with sand or very poor earth; the design of this is to keep the Grass fine, by preventing its growing too rank; this is proper enough for very rich ground, but it is not so for such land, as is but middling or poor; for when this is practised in such places, the Grass will soon wear out, and decay in patches.

When turf is taken from a common or down, such ought to be chosen as is free from weeds: and when it is designed to remain for years without renewing, a dressing should be laid upon it every other year, either of very rotten dung, ashes, or where it can be easily procured, very rotten tan; but these dressings should be laid on early in the winter, that the rain may wash them into the ground, otherwise they will occasion the Grass to burn, when the warmth of the summer begins. Where Grass is so dressed, and kept well rolled and mowed, it may be kept very beautiful for many years; but where it is not dressed, or fed with sheep, it will rarely continue handsome more than eight or ten years.

GRASS of *Parnassus*, *Parnassia*, a genus of plants, of which there are two species. 1. Common Marsh Grass of *Parnassus*. 2. Grass of *Parnassus*, with double flowers.

The first species grows wild in moist meadows, in several parts of England, but particularly in the north.

The second species seems to be an accidental variety of the first. It grows wild, as the former sort, but is rarely to be found.

Culture of the GRASS of Parnassus.

These plants may be taken up from the natural places of their growth, with balls of earth to their roots, and planted into pots filled with pretty strong, fresh, undunged earth, and placed in a shady situation, where, if they are constantly watered, they will thrive very well and flower every summer; but if the plants are planted in the full ground, it should be in a very moist, shady border, otherwise they will not thrive; and these should be as duly watered, as those in the pots in dry weather, to make them produce strong flowers.

They may be propagated by parting of their roots, which should be done in March, before they put out new leaves, but the roots should not be divided too small, for that will prevent their flowering the following

summer. These roots should always be planted in pretty strong fresh earth, for they will not thrive in a light, rich soil. In the spring they must be constantly watered, if the season should prove dry, otherwise they will not flower; nor should they be parted oftener than every third year, to have them strong. These plants flower in July, and their seeds are ripe the latter end of August.

Mountain Knot GRASS, *Paronitbia*, a genus of plants, of which there are two species. 1. Mountain Knot Grass, with flowers sitting close to the wings of the stalk, having neat bractæ and trailing stalks. 2. Mountain Knot Grass, with diffused trailing stalks, flowers growing in clusters, whose bractæ are very neat.

There are two or three others, species of this genus, which grow naturally in the south of France and Italy, which having little beauty, are rarely admitted into gardens, so it would be needless to enumerate them here.

The first species grows naturally in Spain; this hath trailing stalks, like those of the common Knot Grass, which are a foot and a half long, putting out several side branches, which are garnished with small leaves, like those of the common Knot Grass, but smaller, sitting close to the stalks. The flowers come out at the wings of the leaves, sitting close to the stalks; these have silvery neat bractæ, which incloses the flowers, which are so small as not to be visible, unless they are close to the sight. The flowers appear in July.

The second sort grows naturally in Spain; the stalks of this plant are larger, and the branches more diffused than those of the first sort, but trail upon the ground in the like manner. The flowers come out in close clusters upon short foot-stalks, from the side of the branches, surrounded by leaves shaped like those of the Knot Grass; the bractæ of these flowers are silvery and neat, like those of the first sort.

Culture of the Mountain Knot GRASS.

These plants seldom continue longer than two or three years, and rarely ripen seeds here, except in warm dry seasons, but cuttings of them will take root. The plants will rise from seeds in the open air, and will live abroad in mild winters, but in hard frosts they are destroyed.

Viper's GRASS, *Scorzonera*, a genus of plants, ranged by Linnæus among the *Syngenesia polygamia æqualis*, and of which there are eight species, one only of which is cultivated in gardens, viz: *Viper's Grass*, with a branching stalk, and serrulated entire leaves, embracing the stalks.

This species is a native of Spain and Siberia.

Culture of the Viper's GRASS.

It is a perennial plant, and is propagated by sowing the seeds about the beginning of April, upon a spot of light, fresh soil.

When the plants are come up, they should be weeded and thinned, so as to be left half a foot asunder, after which they will require no other culture but to be kept clean from weeds.

GRAVEL, in gardening, a congeries of pebbles, which, mixed with a stiff loam, makes lasting and elegant walks, an ornament peculiar to our gardens, and what gives them the advantage over those of other nations. There are many different opinions about the choice of gravel; some are for having it as white as possible, and in order to make the walks more so, cause them to be rolled with stone rollers, which are often hewn by the masons, so as to add a whiteness to the walks; but this renders them troublesome to the eye, by their reflecting too strongly the rays of light; this, therefore, should be avoided, and such Gravel as will be smooth and reflect the least, should be preferred. There are some who screen the Gravel too fine, but this is an error; for if it be cast into a round heap, and the great stones only are raked off, it will be the better. There are some kinds of Gravel which do not bind, and by this means cause a continual trouble of rolling, to very little purpose; as for such, if the Gravel be loose or sandy, you should take one load of strong loam, and

two of Gravel, and so cast them well together. The month of March is the properest time for laying Gravel; for it is not prudent to do it sooner, or to lay walks in any of the winter months before that time. In making these walks, great regard must be had to the level of the ground, so as to lay the walks with easy descents towards the low parts of the ground, that the wet may be easily drained off: but when the ground is level, it will be proper to have sink-stones laid by the sides of the walks, and at convenient distances, to let off the wet; and when the ground is naturally dry, the drains from the sink-stones may be contrived so as to convey the water into sels-pools, from which the water will soak away in a short time: but in wet lands, there should be under-ground drains, to convey the water off, either into ponds, ditches, or the nearest place proper to receive it. Some are apt to lay Gravel-walks too round; but this is an error, because they are not so good to walk upon; and besides, it makes them look narrow; one inch is enough in a crown for a walk of five feet: and it should be ten feet wide, it lies two inches higher in the middle than it does on each side: if fifteen feet, three inches, if twenty feet, four inches, and so in proportion; for the depth of Gravel-walks, six or eight inches, may do well enough, and a foot in thickness will be sufficient for any: but then there should always be a depth of rubbish laid under the Gravel, especially if the ground be wet. Some turn up Gravel-walks into ridges in December, in order to kill the weeds: but this is very wrong, since it never answers the end, and therefore, if constantly rolling them after rain and frost, will not effectually kill the weeds and moss, you should turn the walk in March, and lay them down at the same time.

GREEN-HOUSE, or CONSERVATORY, a house in a garden, contrived for sheltering and preserving the most tender and curious exotic plants, which, in our climate, will not bear to be exposed to the open air during the winter season. These are generally large and beautiful structures, equally ornamental and useful.

The length of these houses must be proportioned to the number of plants they are intended to contain; but their depth should never be greater than their height in the clear, which, in small or middling houses, may be sixteen or eighteen feet, and in large ones from twenty to twenty-four. The windows in front should extend from about one foot and a half above the pavement, to within the same distance of the ceiling, which will admit of a cornice round the building, over the heads of the windows. In a small green-house, the sashes should not be less than four or five feet broad; and in a large one, they ought not to exceed seven and a half; the shutters of which ought to fall back close to the piers on the inside, that, when open, they may not prevent any of the rays of light from reaching the plants. The piers between these windows, supporting the building, should be as narrow as possible; for which reason they should be either of stone or well-burnt brick. If they are of stone, they ought not to exceed two feet and a half in front, and should be sloped off backward to about eighteen inches broad, by which means the rays of the sun will not be obstructed by the corners of the piers, as they would be if they were square: but if they are built of brick, it will be proper to make them near three feet in front, otherwise they will be too weak to support the building: these I would also advise to be sloped off in the manner directed for the stone.

At the back of the green-house, there may be erected an house for tools, and many other purposes; which will be extremely useful, and also prevent frost from entering the house that way; so that the wall between these need not be more than two bricks and an half in thickness; whereas, were it quite exposed behind, it should be at least three bricks in thickness; and by this contrivance, if you are willing to make an handsome building, and to have a noble room over the green-house, you may make the room over the tool-house, and carry up the stair-case in the back, so as not to be seen in the green-house; and hereby you may have a room twenty-five or thirty feet

in width, and of a proportionable length: and under this stair-case, there should be a private door into the green-house, at which the gardener may enter in hard frosty weather, when it will not be safe to open any of the glasses in the front. The floor of the green-house, which should be laid either with marble, stone, or broad tiles, according to the fancy of the owner, must be raised two feet above the surface of the ground whereon the house is placed, which, in dry ground, will be sufficient: but if the situation be moist and spongy, and thereby subject to damps, it should be raised at least three feet above the surface. and if the whole is arched with low brick arches under the floor, it will be of great service in preventing the damps rising in winter, which are often very hurtful to the plants, especially in great thaws, when the air is often too cold to be admitted into the house, to take off the damps. Under the floor, about two feet from the front, I would advise a flue of about ten inches in width, and two feet deep, to be carried the whole length of the house, which may be returned along the back part, and be carried up in proper funnels adjoining to the tool-house, by which the smoke may pass off. The fire-place may be contrived at one end of the house, and the door at which the fuel is put in, as also the ash-grate, may be contrived to open into the tool-house, so that it may be quite hid from the sight, and be in the dry, and the fuel be laid in the same place, whereby it will always be ready for use.

I suppose many people will be surpris'd to see me direct the making flues under a green-house, which has been disused so long, and by most people thought of ill consequence, as indeed they have often proved, when under the direction of unskilful managers, who have thought it necessary, whenever the weather was cold, to make fires therein. But however injurious flues have been under such management, yet, when skilfully managed, they are of very great service: for though perhaps it may happen that there will be no necessity to make any fires in them for two or three years together, as, when the winters prove mild, there will not; yet, in very hard winters, they will be extremely useful to keep out the frost, which cannot be effected any other way, but with great trouble and difficulty.

Withinside of the windows, in front of the green-house, you should have good strong shutters, which should be made with hinges, to fold back, that they may fall back quite close to the piers, that the rays of the sun may not be obstructed thereby. These shutters need not to be above an inch and a half thick, or little more; which, if made to join close, will be sufficient to keep out our common frost: and when the weather is so cold as to endanger the freezing in the house, it is but making a fire in your flue, which will effectually prevent it: and without this conveniency it will be very troublesome, as I have often seen, where persons have been obliged to nail mats before their windows, or to stuff the hollow space between the shutters and the glass with straw, which, when done, is commonly suffered to remain till the frost goes away; which, if it should continue very long, the keeping the green-house closely shut up, will prove very injurious to the plants: and as it frequently happens, that we have an hour or two of sun-shine in the middle of the day, in continued frosts, which is of great service to plants, when they can enjoy the rays thereof through the glasses; so when there is nothing more to do than to open the shutters, which may be performed in a very short time, and as soon shut again when the sun is clouded, the plants may have the benefit thereof whenever it appears; whereas, where there is so much trouble to uncover, and as much to cover again, it would take up the whole time in uncovering and shutting them up, and thereby the advantage of the sun's influence be lost. Besides, where there is so much trouble required to keep out the frost, it will be a great chance if it be not neglected by the gardener: for if he be not as fond of preserving his plants, and as much in love with them as his master, this labour will be thought too great by him; and if he takes the pains to cover the glasses up with mats, &c. he will not care to take

them away again; until the weather alters; so that the plants will be shut up close during the whole continuance of the frost.

There are some people who commonly make use of pots filled with charcoal to set in their green-house in very severe frosts; but this is very dangerous to the persons who attend these fires; and I have often known they have been almost suffocated therewith; and at the same time they are very injurious to the plants: nor is the trouble of attending upon these small; and the many hazards, to which the use of these fires is liable, have justly brought them into disuse with all skilful persons; and as the contrivance of flues, and of the fires, are but small charges, they are much to be preferred to any other method for warming the air of the house.

The back part of the house should be either laid over with stucco, or plastered with mortar, and white washed; for otherwise the air in severe frost will penetrate through the walls, especially when the frost is attended with a strong wind; which is often the case in the most severe winters. There are some persons who are at the expence of wainscoting their green-houses; but, when this is done, it is proper to plaster with lime and hair behind the wainscot, to keep out the cold; and, when they are lined with wainscot, they should be painted white, as should the ceiling, and every part within-side of the house: for this reflects the rays of light in much greater quantity than any other colour, and is of signal service to plants especially in the winter, when the house is pretty much closed, and but a small share of light is admitted through the windows: for, at such times, I have observed, that in some green-houses which have been painted black, or of a dark colour, the plants have cast most of their leaves.

Where green-houses are built in such places as will not admit of rooms over them, or the person is unwilling to be at the expence of such building, there must be care taken to keep out the frost from entering through the roof. To prevent which, it will be very proper to have a thickness of reeds, heath, or furze, laid between the ceiling and the tiles: in the doing of which, there must be care taken in framing the joists, so as to support these, that their weight may not lie upon the ceiling, which might endanger it: for these should be laid a foot thick at least, and as smooth as possible, and fastened down well with laths, to prevent their rising; and then cover it over with a coat of lime and hair, which will keep out the air, and also prevent mice and other vermin, from harbouring in them; which, if left uncovered, they would certainly do. For want of this precaution, there are many green-houses built, which will not keep out the frost in hard winters; and this is many times attributed to the glasses in front admitting the cold, when the fault is in the roof: for where there is only the covering, either of tiles or slates, and the ceiling, every severe frost will penetrate through them.

In this green-house you should have trellis, which may be moved out and into the house; upon which you should fix rows of planks, so as to place the pots or tubs of plants in regular rows one above another, whereby the heads of the plants will be so situated as not to interfere with each other. The lowest row of plants, which should be the forwardest towards the windows, should be placed about four feet therefrom, that there may be a convenient breadth left next the glasses to walk in front: and the rows of plants should rise gradually from the first, in such a manner, that the heads of the second rows should be entirely advanced above the first, the stems only being hid thereby; and, at the backside of the house, there should be allowed a space of at least five feet, for the conveniency of watering the plants; as also to admit of a current of air round them, that the damps, occasioned by the perspiration of the plants may be the better dissipated, which, by being pent in too closely, often occasions a mouldiness upon the tender shoots and leaves, and when the house is close shut up, this stagnating rancid vapour is often very destructive to the plants: for which reason also you should never crowd them too close to each other,

nor should you ever place sedums, euphorbiums, torch thistles, and other tender succulent plants, amongst oranges, myrtles, and other ever-green trees; for, by an experiment which I made anno 1729, I found that a sedum, placed on a green-house among such trees, almost daily increased its weight, although there was no water given to it the whole time; which increase of weight was owing to the moisture imbibed from the air, which, being replete with the rancid vapours perspired from the other plants, occasioned the leaves to grow pale, and in a short time they decayed, and dropped off; which I have often observed has been the case with many other succulent plants, when placed in those houses which were filled with many sorts of ever-green-trees, that required to be frequently watered.

Therefore, to avoid the inconvenience which attends the placing of plants of very different natures in the same house, it will be very proper to have two wings added to the main green-house; which will greatly add to the beauty of the building, and also collect a greater share of heat. The green-house should be placed exactly fronting the south; and one of the wings facing the south-east, and the other the south-west; so that, from the time of the sun's first appearance upon any part of the building, until it goes off at night, it is constantly reflected from one part to the other; and the cold winds are also kept off from the front of the main green-house hereby: and, in the area of this place, you may contrive to place many of the most tender exotic plants, which will bear to be exposed in the summer season: and in the spring, before the weather will permit you to set out the plants, the beds and borders of this area may be full of anemones, ranunculus's, early tulips, &c. which will be past flowering, and the roots fit to take out of the ground, by the time you carry out the plants; which will render this place very agreeable during the spring season that the flowers are blown; and here you may walk and divert yourself in a fine day, when, perhaps the air in most other parts of the garden will be too cold for persons not much used thereto, to take pleasure in being out of the house.

In the center of this area may be contrived a small basin for water, which will be very convenient for watering of plants, and add much to the beauty of the place: besides, the water, being thus situated, will be softened by the heat, which will be reflected from the glasses upon it; whereby it will be rendered much better than raw, cold water, for these tender plants.

The two wings of the building should be contrived so as to maintain plants of different degrees of hardiness; which must be effected by the situation and the extent of the fire-place, and the manner of conducting the flues.

But I would here observe, that the wing facing the south-east should always be preferred for the warmest stove; its situation being such, as that the sun, upon its first appearance in the morning, shines directly upon the glasses; which is of great service in warming the air of the house, and adding life to the plants, after having been shut up during the long nights in the winter season. These wings, being sixty feet in length, may be divided in the middle by partitions of glass, with glass doors to pass from one to the other. To each of these there should be a fire-place, with flues carried up against the back wall, through which the smoke should be made to pass, as many times the length of the house, as the height will admit of the number of flues; for the longer the smoke is in passing, the more heat will be given to the house, with a less quantity of fuel; which is an article worth consideration, especially where fuel is dear. By this contrivance, you may keep such plants as require the same degree of heat in one part of the house, and these will thrive in a much less warmth in the other part.

The other wing of the house, facing the south-west, may also be divided in the same manner, and flues carried through both parts, which may be used according to the seasons, or the particular sorts of plants which are placed therein; so that here will be four divisions in the wings, each

each of which may be kept up to a different degree of warmth: which, together with the green-house, will be sufficient to maintain plants from all the several countries of the world; and, without having these several degrees of warmth, it will be impossible to preserve the various kinds of plants from the several parts of Africa and America, which are annually introduced into the English gardens; for when plants from very different countries are placed in the same house, some are destroyed for want of heat, while others are forced and spoiled by too much of it; and this is often the case in many places, where there are large collections of plants.

In the building these wings, if there are not sheds running behind them their whole length, the walls should not be less than two bricks thick; and if they are more, it will be better; because, where the walls are thin, and exposed to the open air, the cold will penetrate them; and when the fires are made, the heat will come out through the walls; so that it will require a larger quantity of fuel to maintain a proper temperature of warmth in the house. The back part of these houses, having sloping roofs, which are covered either with tiles or slates, should also be lined with reeds, &c. under the covering, as is before directed for the green-house; which will keep out the cold air, and save a great expence of fuel; for the closer and better these houses are built, and the glasses of the slope, as also in front, well guarded by shutters or reeds in a hard frost, the less fuel will be required to warm the houses; so that the first expence of building these houses properly will be the cheapest, when the after expence of fires is taken into consideration.

The sloping glasses of these houses should be made to slide, and take off; so that they may be drawn down more or less, in warm weather, to admit air to the plants; and the upright glasses in front may be so contrived, as that every other may open as doors upon hinges; and the alternate glasses may be divided into two: the upper part of each should be contrived so as to be drawn down like shades; so that either of these may be used to admit air, in a greater or less quantity, according as there may be occasion.

But, besides the conservatories here mentioned, it will be proper to have a deep hot-bed frame, such as is commonly used to raise large annuals in the spring: into which may be set pots of such plants as come from Carolina, Virginia, &c. while the plants are too small to plant in the open air; as also many other sorts from Spain, &c. which require only to be screened from the violence of the frosts, and should have as much free air as possible in mild weather: which can be no better effected than in one of these frames, where the glasses may be taken off every day when the weather will permit, and put on every night; and in hard frosts, the glass may be covered with mats, straw, pease-haulm, or the like, so as to prevent the frost from entering the pots to freeze the roots of the plants, which is what will many times utterly destroy them; though a slight frost pinching the leaves or shoots very seldom does them much harm: if these are sunk a foot or more below the surface of the ground, they will be the better, provided the ground is dry; otherwise they must be wholly above ground. The sides of this frame should be built with brick, with a curb of wood laid round on the top of the wall, into which the gutters, on which the glasses slide may be laid; the back wall of this frame may be four feet high, and the front one foot and a half; the width about six feet, and the length in proportion to the number of plants. *Miller's Gard. Dict.*

GREWIA, a genus of plants for which we have no English name; ranged by Linnæus among the *gynandria polyandria*, and of which he enumerates only two species. 1. *Grewia* with oval crenated leaves. 2. *Grewia* with oval spear-shaped leaves, which are serrated.

The first species grows naturally at the Cape of Good Hope; it rises to the height of ten or twelve feet, the stem and branches are very like those of the small Elm, the bark being smooth, and of the same colour as that when young; the leaves are also very like those of the

Elm, and fall off in autumn; the flowers are produced singly along the young branches, from the wings of the leaves, which are of a bright purple colour.

The second species is a native of the East and West Indies, and of Africa; it is a very elegant little shrub, and from its handsome growth, as well as the singularity of its flowers, deserves a place in every collection.

It grows about five feet high, and spreads in a pleasing manner into branches. The bark of the main stem is greyish, and that of the young shoots brown, and often purplish; they are very slender, and are armed with a few slight, and almost harmless thorns. The leaves are placed with pleasing irregularity, sometimes in pairs; sometimes alternately; they are an inch and a half long, and an inch broad. They have short footstalks, and their colour is a pale but pleasing green. Their edges are serrated, and they are pointed at the ends. The flowers are scattered over various parts of the shrub; they are large, open, and of a pale purple, with a great cluster of yellow buttons in the centre. This flower is placed in a five-leaved cup, of a firm tough substance, and coloured on the inner side; and is succeeded by a fruit of the berry kind, but square, and divided within into four cells. The petals of the flower are properly five, but they are so mixed among the leaves of the cup, and those are so large and coloured, that the flower appears to consist of twice that number.

Culture of the GREWIA.

The first species is propagated by cuttings, or layers; if by cuttings they should be taken off, and planted in March, before the buds begin to swell, for they do not succeed so well after; these cuttings should be planted in small pots filled with loamy earth, and the pots plunged into a moderate hot-bed of tanners bark, and shaded from the sun in the middle of the day; these will take good root in about four months, and may then be gradually inured to bear the open air, into which they should be removed, and placed in a sheltered situation, where they may remain till autumn, when they must be removed into the green-house; the best time to lay down the layers of this plant is in the spring before the buds come out, and these will be rooted by the same time the following year, when they may be cut off from the old plants, and planted each into a separate pot filled with soft loamy earth.

The best time to remove or transplant this plant is, either in the spring, just before the buds begin to swell, or in autumn when the leaves begin to drop; for in summer, when the plants are in full leaf, it will not be so proper to disturb them.

In winter these plants should be placed in the green-house, for they are too tender to live abroad in England; but they should have as much free air as possible in mild weather, as they only require to be protected from frost, and after the leaves are fallen they will require very moderate watering; but in summer they should have it more constantly in dry weather.

The second species may be raised from seeds: they must be sown in spring on a moderate hot-bed. The plants, when come up, must have a little water carefully given them; and when they have gained a little strength, they must be transplanted into pots filled with the following compost: equal parts of garden-mould and river-mud, with a small sprinkling of coarse sand; this should be mixed at the time the seeds are sown in the hot-bed.

Set the pots up to the rim in a bark-bed of a moderate heat, and shaded till they are well rooted: from this bed, when they have gained some height, they must be removed into another, first planting them into larger pots; and when they have been shaded in this, and watered till they have taken good root, they must be by degrees inured to the air. In the height of summer they may be exposed among the green-house plants; but before the least approach of cold, they must be housed, first taken into the green-house, and then into the stove.

This species may also be propagated by layers, in which method there is nothing particular, only observe to lay them into pots of the same compost; and when they have

have taken sufficient root, they may be treated in all respects as the others. This shrub will bear the open air, but it will never flower so well as in the stove.

GROTTO, a small artificial edifice made in a garden, in imitation of a natural Grotto. The outsides of these Grottos are usually adorned with rustic architecture, and their inside with shell-work, coral, &c. and also furnished with various fountains and other ornaments. The following is esteemed a good cement for Grotto-work.

Take two parts of white rosin, melt it clear, add to it four parts of bees-wax : when melted together, add some dust of the stone you design to cement, two or three parts, or so much as will give the cement the colour of the stone : to this add one part of the flower of sulphur ; first incorporate all together over a gentle fire, and afterwards knead it with your hands in warm water ; with this fasten the stones, shells, &c. after they are well dried, and warmed before the fire.

GROVE, a small wood impervious to the rays of the sun.

Groves are the greatest ornaments of a garden ; nor can a garden be complete that has not one or more of these. In small gardens there is scarce room to admit of groves of any extent ; yet in these there should be at least one contrived, which should be as large as the ground will allow of ; and where these are small, there is more skill required in the disposition, to give them the appearance of being larger than they really are.

Groves are of two sorts, viz. open and close ; open Groves are such as have large shady trees, which stand at such distances, as that their branches may approach so near to each other, as to prevent the rays of the sun from penetrating through them : but as such trees are a long time in growing to a proper size for affording a shade, so where new Groves are planted, the trees must be placed closer together, in order to have shade as soon as possible ; but in planting of these Groves, it is much the best way to dispose all these trees irregularly, which will give them a greater magnificence, and also form a shade sooner than when the trees are planted in lines ; for when the sun shines between the rows of trees, as it must do some part of the day in summer, the walks between them will be exposed to the heat, at such times, until the branches of these trees meet ; whereas, in the irregular plantations, the trees intervene, and obstruct the direct rays of the sun.

When a person, who is to lay out a garden, is so happy as to meet with large full grown trees upon the spot, they should remain inviolate, if possible ; for it will be better to put up with many inconveniencies, than to destroy these, which will require an age to retrieve ; so that nothing but that of offending the habitation, by being so near as to occasion great damps, should tempt the cutting them down.

Most of the Groves which have been planted in England, or those celebrated gardens in France, are only a few regular lines of trees, many of which join to the habitation, or lead to some building, or other object : but these do not appear so grand, as those which have been made in woods, where the trees have grown accidentally, and at irregular distances, where the trees have large spreading heads, and are left at such distance as to permit the grass to grow under them, then they afford the greatest pleasure ; for nothing is more noble than fine spreading trees with large stems, growing through grass, especially when the grass is well kept, and has a good verdure ; besides most of these planted Groves have generally a gravel walk, made in a strait line between them ; which greatly offends the sight of persons who have a true taste : therefore, whenever a gravel walk is absolutely necessary to be carried through these Groves, it will be much better to twist it about, according as the trees naturally stand, than to attempt regularity : but dry walks under large trees are not so useful as in open places ; because the dropping of the trees will render these walks useless, after rain, for a considerable time.

Close Groves have frequently large trees standing in them ; but the ground is filled under these with shrubs,

or underwood ; so that the walks which are made in them are private, and screened from the winds, whereby they are made agreeable for walking, at such times when the air is too violent or cold for walking in the more exposed part of the garden.

These are often contrived so as to bound the open Groves, and frequently to hide the walls, or other inclosures of the garden : and when they are properly laid out, with dry walks winding through them, and on the sides of these sweet smelling shrubs and flowers irregularly planted, they have a charming effect ; for here a person may walk in private, sheltered from the inclemency of cold or violent winds, and enjoy the greatest sweets of the vegetable kingdom : therefore, where it can be admitted, if they are continued round the whole enclosure of the garden, there will be a much greater extent of walk : and these shrubs will appear the best boundary where there are not fine prospects to be gained.

These close Groves are by the French termed bosquets, from the Italian word boschetto, which signifies a little wood ; and in most of the French gardens there are many of these planted ; but these are reduced to regular figures, as ovals, triangles, squares, and stars : but these have neither the beauty or use which those have that are made irregularly, and whose walks are not shut on each side by hedges, which prevents the eye from seeing the quarters ; and these want the fragrantcy of the shrubs and flowers, which are the great delight of these private walks ; add to this the keeping of the hedges in good order, is attended with a great expence ; which is a capital thing to be considered in the making of gardens. *Milner's Gard. Dict.*

GROUND-PINE, a species of Tree Germander. See the article *Tree GERMANDER*.

GROUNDSEL, *Erigeron*, a genus of plants, ranged by Linnæus among the *syngenesia polygamia superflua*, and of which there are twelve species. 1. Groundsel, with one flower on a foot-stalk, proceeding from the side of the stalk, and a rough cup. 2. Groundsel, with a paniculated stalk, single flowers terminating the branches, and entire narrow leaves. 3. Groundsel, with a paniculated stalk and flowers. 4. Groundsel, with the leaves curved at their base. 5. Groundsel, with many flowers upon a stalk, spear-shaped, sawed leaves, and the stalk-leaves half embracing the flowers. 6. Groundsel, with one flower upon alternate foot-stalks. 7. Groundsel, with two flowers on a stalk, and a hairy cup. 8. Groundsel, with one flower upon a stalk, and a hairy cup. 9. Groundsel, with one flower upon a stalk, and narrow, hairy, rough leaves. 10. Groundsel, with the flower-scales of the cup loose, and exceeding the flower. 11. Groundsel, with spear-shaped, oval, hairy leaves, and cartilaginous serratures at the top. 12. Groundsel, with spear-shaped leaves, one flower upon a branch, and a shrubby stalk.

The first and second sorts are perennial plants, the first grows naturally in France, Spain, and Italy : and the second is a native of Carolina.

The third and fourth sorts are annual plants, and natives of America.

The fifth, sixth, seventh, eighth, and ninth species, are perennial plants. The tenth grows naturally in marshy places in Sicily.

The eleventh is a native of Virginia, and the twelfth of France and Syria.

Culture of this GROUNDSEL.

The two first species are propagated by seeds sown soon after they are ripe ; when the plants come up, let them be thinned where they grow too close, and kept clear from weeds, and the next autumn they may be transplanted to the places in which they are designed to remain, which should be in a dry soil and a sunny exposure. The third and fourth sorts are only preserved in botanic gardens for the sake of variety. The fifth, sixth, seventh, eighth, and ninth, are seldom admitted into gardens : the rest are annuals.

The tenth, eleventh, and twelfth, may be propagated by sowing the seeds, but they are seldom cultivated in gardens.

GROUNDSEL,

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GROUNDSEL, *Senecio*. Of this genus there are, according to Linnæus, twenty-seven species, sixteen of which are cultivated in gardens. 1. Groundsel, with naked petals, torn leaves embracing the stalk, and an erect herbaceous stalk. 2. Groundsel, with naked florets, and a very long foot-stalk, which is almost naked, called China Root. 3. Groundsel, with radiated flowers, and crenated leaves, the lower ones of which are heart-shaped, and have foot-stalks, but the upper lyre-shaped and wing-pointed. 4. Groundsel, with radiated flowers three times the length of the leaves, and winged sinuated leaves. 5. Groundsel, with radiated flowers, wing-pointed leaves, which are equal, and the midrib below narrowed. 6. Groundsel, with radiated flowers, and wing-pointed, multifid, linear leaves. 7. Groundsel, with radiated flowers, sword-shaped leaves, which are acutely sawed, a little hairy on their under-side, and a close stalk. 8. Groundsel, with radiated flowers growing in a corymbus, and spear-shaped, sawed, smooth leaves. 9. Groundsel, with radiated flowers growing in a corymbus, and spear-shaped, sawed leaves, half embracing the stalk. 10. Groundsel, with radiated flowers growing in a corymbus, and sword-shaped indented leaves, which half embrace the stalks. 11. Groundsel, with radiated flowers growing in a corymbus, the lower leaves oblong, heart-shaped, sawed, and those on the stalks spear-shaped, entire, embracing the stalks. 12. Groundsel, with radiated flowers, half-winged leaves, which are downy on both sides, segments which are somewhat indented, and a roundish corymbus of flowers. 13. Groundsel, with radiated flowers, oblong, heart-shaped, rough-pointed, sawed leaves, embracing the stalks, which are shrubby. 14. Groundsel, with radiated flowers, arrow-pointed indented leaves, embracing the stalks, which are shrubby. 15. Groundsel, with radiated flowers, oval, fleshy leaves, which are somewhat indented, and a shrubby stalk. 16. Groundsel, with naked flowers, linear hairy leaves, growing in clusters, and an under-shrub stalk.

The first sort grows naturally in North America; this is an annual plant: the stalk is round channelled and hairy; it rises three feet high, is garnished with torn leaves, which embrace the stalks with their base; the flowers are produced in a sort of umbel on the top of the stalks, composed of florets, having no rays; they are of a dirty white, and are succeeded by oblong seeds, crowned with a long down.

The second species is a native of Madras: this has a perennial root, which is composed of some thick fleshy tubers, sending out many fibres; the leaves are shaped like those of the Turnep, but are smooth. The flower stalk is slender, almost naked, and rises a foot and a half high, sustaining at the top a few yellow flowers, composed of several hermaphrodite florets, having no rays or borders; these are succeeded by oval seeds, crowned with down, but they rarely ripen in England.

The third sort is a native of North America; this hath a perennial root, from which come out many roundish leaves upon long, slender, hairy foot-stalks, of a purplish colour on their under side, crenated on their edges. The stalks rise near two feet high, garnished with a few leaves, which are indented on each side in form of a lyre; the upper part of the stalk divides into several slender long foot-stalks, each sustaining one erect flower, composed of several hermaphrodite florets in the center, and a few female florets from the rays or border. They are yellow, and are succeeded by seeds, crowned with down.

The fourth species is a native of Africa; this has an herbaceous perennial stalk, which rises about two feet and a half high, garnished at bottom with narrow leaves, which are situated on the sides, so as to resemble winged leaves. The upper leaves are small, and embrace the stalks; they are very clammy, and stick to the fingers on being handled; the upper part of the stalk divides into several very long foot-stalks, each sustaining one yellow radiated flower. The plants continue in flower most part of the summer, and the seeds sometimes ripen in autumn.

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The fifth sort grows naturally at the Cape of Good Hope; it is an annual plant, which hath many herbaceous branching stalks, that rise near three feet high, garnished with equal wing-pointed leaves. The flowers are produced in bunches on the top of the stalks; they are large and radiated, the borders or rays being of a beautiful purple colour, and the middle of a disk yellow. These plants flower from July till the frost stops them, and make a fine appearance.

The sixth species grows naturally on the Alps and Pyrenees; this hath a perennial root and an annual stalk. The root is composed of a great number of long slender fibres; the stalks rise two feet high, and become a little ligneous in autumn: they are garnished with very narrow wing-pointed leaves; the flowers are yellow, and are produced in bunches on the top of the stalks; they have rays or borders, resembling those of the other species.

The seventh sort grows naturally about Paris, by the sides of waters and in moist meadows. The root is perennial; the stalks rise three or four feet high, are close channelled, and garnished with sword-shaped leaves, which are hairy, and sharply sawed on their edges; the upper part of the stalk divides into several slender foot-stalks, sustaining yellow radiated flowers, which are succeeded by downy seeds in autumn, soon after which the stalks decay to the root.

The eighth sort grows naturally on the Helvetian mountains, and is sometimes found growing in low marshy places, in the isle of Ely. This hath a creeping root, by which it spreads wherever it is once established; the stalks of this rise four feet high, garnished with smooth, spear-shaped leaves, sawed on their edges, and placed alternate. The flowers are yellow, radiated, and are produced in a sort of corymbus on the top of the stalk, which are succeeded by seeds, having down.

The ninth species is a native of France: this has some resemblance to the eighth, but the root does not creep like that. The leaves are shorter; the serratures on their edges are very small: they embrace the stalks with their base, and end in sharp points. The flowers are produced in larger and looser bunches on the top of the stalk, and are of a paler yellow colour than those of the former.

The tenth species grows naturally in the Levant; this hath a perennial root. The lower leaves are long, smooth, and somewhat shaped like a scymitar, the midrib being curved outward towards the point, and slightly indented on their edges; the stalk rises six feet high, garnished with leaves, growing smaller towards the top of the stalk. The flowers terminate the stalk in a compact corymbus; they are of a deep yellow, and have rays like those of the former sorts.

The eleventh sort is a native of North America; this has a perennial root, from which come out smooth, heart-shaped leaves, slightly indented on their edges, a little downy on their under side. The stalk rises three feet high, garnished with spear-shaped, entire leaves, embracing them; the flowers terminate the stalk in a close compact corymbus; they are of a deep yellow colour, and are succeeded by seeds, which ripen in autumn.

The twelfth sort grows naturally on the Alps; this is a perennial plant, of low growth. The stalks seldom rise a foot high; the whole plant is covered with a very white hoary down; the leaves are winged and indented; the flowers are collected into a close round corymbus, on the top of the stalk, of a gold colour, and are radiated; these are rarely succeeded by good seeds in England.

The thirteenth species is a native of the Cape of Good Hope; this rises with a shrubby, branching stalk, six or seven feet high, closely garnished with rough leaves, whose base embraces the stalks; they are stiff, hairy, of a dark green colour, oblong, heart-shaped, and indented on their edges. The flowers are produced at the end of the branches, which are of a bright yellow colour, and are succeeded by seeds in autumn.

The fourteenth sort grows naturally at the Cape of Good Hope. This hath a very branching shrubby stalk, which rises four or five feet high, garnished with stiff

leaves, whose base embraces the stalks; they are irregular in their figure, deeply cut on their edges, and of a grey colour on their under side. The flowers grow in loose bunches at the end of the branches, of a pale yellow colour. This sort flowers great part of summer, and the seeds ripen in autumn.

The fifteenth species is a native of the Cape of Good Hope. This has a shrubby stalk, which rises seven or eight feet high, garnished with oblong oval leaves, indented on their edges. The flowers are produced in loose bunches at the extremity of the branches, almost in the form of an umbel; they are of a pale yellow colour.

The sixteenth sort grows naturally at the Cape of Good Hope. This is a perennial plant from whose roots arise several hairy herbaceous stalks four feet high, garnished with hairy linear leaves in clusters, which sit close to the branches; they are of a deep green on their upper side, and pale on their under. The flowers are produced at the end of the branches in close bunches, formed like umbels of a gold colour, but have no rays or borders, only hermaphrodite florets, which are included in one common impalement.

Culture of the GROUNDSEL.

The first species may be propagated by sowing the seeds on a hot-bed in the spring, and when the plants are come up fit to remove, they should be transplanted to another hot-bed to bring them forward, and afterwards they may be planted in a warm border, where they will flower in July, and their seeds will ripen in autumn. This plant is seldom in other than botanic gardens for the sake of variety.

The second species is propagated by parting the roots in the spring. The off-sets should be planted in pots, filled with light earth, and plunged into the tan-bed in the stove, and treated in the same way as other tender exotics.

The third sort is propagated by off-sets, which come out in plenty from the root; these may be separated in autumn, and planted in an east border, allowing each plant two feet room to spread. When they have taken new root, they will require no other care, but to keep them clean from weeds.

The fourth species may be propagated by cutting off the side shoots in any of the summer months, and planting them in a shady border, where in six weeks they will root, and may then be taken up, and planted in pots, placing them in the shade till they have taken new root; then they may be removed to an open situation, and in autumn they must be placed under a frame, where they may be screened from hard frosts, for they will not live abroad in winter here.

The fifth sort is propagated by sowing the seeds in the spring, and when the plants are fit to remove they may be transplanted about the border of the flower-garden. The seeds ripen in autumn, which, if permitted to scatter, there will plenty of plants rise the spring following without further care.

The sixth species is propagated by seeds, which should be sown upon a bed of loamy earth, where it is exposed only to the morning sun, and the plants will rise better than in a warmer situation. When the plants are fit to remove, they may be transplanted in a shady border, where they may remain till autumn, observing to keep them clear from weeds all the summer; then they should be transplanted to the place where they are to remain. The following summer the plants will flower and produce ripe seeds, and the roots will continue, if they are in a shady situation and a loamy soil.

The seventh, eighth, ninth, tenth, and eleventh species are easily propagated by seeds or parting of their roots; the latter is generally practised when the plant is once obtained, as that is the most expeditious method, especially for the eighth sort, whose roots are apt to spread and encrease too fast, where they are not confined. The best time to transplant and divide these roots is in autumn, when their stalks decay, that they

may get good rooting before the spring. These plants are too large for small gardens, so are proper furniture for large borders in extensive gardens, for they should have at least four feet allowed to each.

The twelfth species is propagated by flipping off the head in the autumn, and planting them in a bed of loamy earth in a shady situation, where they will put out roots, and may afterwards be transplanted into an east border, where they may have the morning sun only, for this plant loves a gentle loamy soil, and a situation not too much exposed to the sun.

The thirteenth, fourteenth, fifteenth, and sixteenth species are propagated by seeds or cuttings, but the latter being the most expeditious method is generally practised. If the cuttings are planted in a shady border during any of the summer months, they will readily take root; they then should be taken up, and each planted in a separate pot, and placed in the shade till they have taken new root: then they may be removed to a more open situation, where they may remain till there is danger of sharp frost, when they should be removed into the green-house, for they are too tender to live in the open air through the winter in England.

African-tree GROUNDSEL, a species of foreign Coltsfoot. See the article FOREIGN COLTSFOOT.

GUAJACUM, *Lignum Vitæ*, or *Packwood*, a genus of plants of which there are three species. 1. Guajacum with obtuse lobes placed by pairs. 2. Guajacum with many pair of obtuse lobes. 3. Guajacum with many pair of acute-pointed leaves.

The first and second species are natives of most of the islands in the West-Indies. The first is a large tree; the bark is hard, brittle, brownish, and not very thick. The wood is firm, solid, ponderous, very resinous, of a blackish yellow colour in the middle, and has a hot aromatic taste. The smaller branches have an ash-coloured bark, the leaves are divided by pairs, each pair having two pair of small, oval, blunt pinnæ, of a stiff consistence, and a lucid green. The flowers are produced in clusters at the ends of the branches, composed of five oval concave petals of a fine blue colour. This tree is the common *Lignum Vitæ*, or Guajacum of the shops.

The second species has many small leaves placed along the midrib by pairs, which are rounded and obtuse at their ends, but narrow at their base: they are of the same consistence as those of the former sort, but of a darker green. The flowers are produced in loose bunches towards the end of the branches; they are of a fine blue colour, and their petals are fringed on their edges.

The third species grows naturally at the Cape of Good Hope, and has long been an inhabitant of some curious gardens both in England and Holland. It retains its leaves, which are of a beautiful green, all the year; but seldom produces flowers here.

Culture of the GUAJACUM.

The first and second species can only be propagated by seeds, which must be procured from the countries where they naturally grow, as fresh as possible, otherwise they will not succeed. These should be sown in pots, and plunged into a good hot-bed. If the seeds are good, and the bed of a proper temperature of heat, the plants will appear in six or eight weeks after, and in six weeks or two months more will have attained strength sufficient for transplanting, when they should be carefully taken out of the pots, so as to preserve their roots as entire as possible, and each planted in a separate small pot, and plunged into a new hot-bed of tanners bark, where they must be shaded from the sun till they have taken fresh root; after which they must be treated in the same manner as other tender exotics from the warm countries, admitting a large share of free air to them when the weather is warm.

While the plants are young, they may be kept during the summer season in a hot-bed of tanners bark under a frame; but in autumn they must be removed into the bark-stove, and plunged into the hot-bed of tan, where they

they should constantly remain, and must be treated in the same manner as other tender plants; being careful not to give them too much water in winter, and in summer admitting a large share of free air to them every day.

With this treatment the plants will thrive very well, but being plants of slow growth in their own country, cannot be expected to make great progress in Europe.

The third species is, with difficulty, propagated by layers, and is of very slow growth. The plants will live in a good green-house in winter, and in summer should be placed abroad with other green-house plants.

GUAYAVA, or *Bay-Plum*, *Psidium*, a genus of plants ranged by Linnæus among the *icofandria monogynia*, and of which there are two species. 1. Guayava with angular branches, oval veined leaves, and a large fruit, or the common red Guayava. 2. Guayava with oblong oval leaves, which are veined, and a small sweet scented fruit, or the small white Guayava.

The first species has a thick trunk which rises to the height of twenty feet, and is covered with a smooth bark. The branches are angular; the leaves oval, having a strong midrib, and many veins running toward the sides, of a light green colour, standing opposite upon very short footstalks. From the wings of the leaves the flowers come out upon footstalks, about an inch and a half long. These are succeeded by a large oval fruit, shaped like a pomegranate, having one cell filled with small seeds; the fruit when ripe has an agreeable odour: and is eaten in the West-Indies both by men and beasts.

The leaves of the second species are much like those of the former, but the branches of the tree are not so angular; the flowers are much smaller, and the fruit is no larger than a middling Gooseberry, but when ripe has a very strong aromatic flavour. This flowers in June, and the fruit ripens in autumn.

There is a third sort of this genus with a large white fruit, supposed to be a variety of the first species, arising from the same seeds, as it is often found intermixed with it. It differs from it in the colour of the midrib of the leaves, which in this are pale, but those of the former are red. The flowers and fruit of this are larger, and the inside of the fruit is white.

Culture of the GUAYAVA.

These plants are propagated by seeds, which when brought over in the entire fruit, gathered full ripe, will succeed with greater certainty. These should be sown in pots filled with kitchen-garden earth, and plunged into a hot-bed of tanners bark, and in six weeks, if the seeds are good, the plants will appear, when they must have free air admitted to them in proportion to the warmth to the season. As soon as the plants have obtained strength enough to be removed, they must each be transplanted into a small pot, filled with the same sort of earth, and plunged into a fresh hot-bed, shading them from the sun till they have taken new root; after which they should have a large share of fresh air admitted to them every day in warm weather to prevent their drawing up weak, and in summer they must frequently be refreshed with water.

In autumn they must be plunged into the tan-bed in the stove, where, during winter, they should be kept in a moderate degree of warmth, and not have too much water, but in summer they will require plenty of wet, and in hot weather a great share of air. With this management the plants will produce flowers and fruit the third year, and may be preserved a long time.

GUELDER-ROSE, a species of *Viburnum*, ranged by Linnæus among the *pentandria trigynia*, and of which there are two species. 1. Guelder-Rose with lobated leaves placed on glandulous footstalks, or the common Guelder-Rose. 2. American Guelder-Rose with acute-pointed sawed leaves, and white flowers.

The first species in its wild state is a native of our own country, and almost every other part of Europe: the

Dutch first brought it from their meadows into gardens, and gave it that round fulness of the bunch of flowers. From them it obtained the name of Guelder-Rose, but is properly called Guelderland-Rose.

The root spreads far, the stem is slender, the bark brown, and the wood white and brittle; the leaves are large and divided into three or more parts, nearly to the footstalk which is glandulous. These parts are called the lobes of a divided leaf; and hence the leaf itself is named lobated. The flowers are extremely beautiful, but their conspicuous elegance is owing more to their disposition than their single form, for they are small. In the re-wild state a few large, white, distinct flowers edge the general umbel, and the rest are small, clustered together, and yellowish; opening later, and having little beauty: but of those which have been raised in gardens, the flowers are of the large, distinct, white kind; and instead of edging a flat umbel, they are clustered into a perfect globular tuft. Each is placed in its proper cup, which is small, dented in five places, and permanent. The body of the flower is formed of a single petal, tubular a little way at the base; expanded thence in a campanulated form, and cut into five regular obtuse segments, which naturally turn back at the end: in each stand five small filaments with rounded buttons and under the receptacle is a roundish rudiment, from which, in the place of a style, rises a gland of a pear-like shape, with three obtuse heads.

The second species is a native of Carolina, and some other parts of North America: this rises with a shrubby stalk eight or ten feet high, sending out many branches, which are covered with a smooth purple bark garnished with heart-shaped oval leaves, ending in acute points; they are deeply sawed on their edges, having many strong veins, and stand upon very long slender footstalks opposite. The flowers are white, and the berries are red when ripe.

Culture of the GUELDER-ROSE.

In order to bring both to their full perfection, the gardener must chuse a piece of ground near which there is water, and digging out the mould to some depth he must fill up the place with fine black meadow earth, mixed with a third part of pond-mud, and a little rotted cow-dung.

He must then chuse some suckers from the root of a thriving tree, that has stood where there is moisture, and consequently bears tolerable tufts of flowers. Let him plant these suckers in the above composts where they will require no other care but covering the ground about their stems the first winter, and frequent gentle waterings the succeeding spring. The time for planting these suckers is in September: and they may be either planted out into a nursery for three years, and then brought into the garden in their full perfection, or set at once in their place. The circumstances of the garden must determine this; but the planting the suckers at once where they are to remain, is the secure way to have handsome shrubs. There is great advantage in the hardiness of this shrub: it is able to bear any severity of cold; the north winds never hurt it, and nothing is to be feared for it but drought and too much sun.

Therefore, let the gardener select for it such parts of his ground as will scarce suit with any thing beside: a damp bottom we have named already, and where there is such a requisite it cannot fail.

Some propagate it by layers; but this is a tedious method. They require to be laid deep, and to have frequent waterings. In a year from the laying they may be transplanted for use, and they will grow freely; but they are no way preferable to those suckers the root furnishes naturally, and which require only to be taken up and put into the ground. The best height for this shrub is about nine feet: it will grow more if permitted, but a skilful gardener will chuse to give it a good full head at this height, and it will be covered at this season with flowers.

GUILANDINA, or **NICKAR-TREE**, a genus of plants, of which there are five species. 1. Prickly Guilandina

landina, with doubly winged leaves, whose lobes are oval, opposite, and entire, called Yellow Nickar. 2. Prickly Guilandina, with oval, small leaves, placed opposite, and sitting close, called Grey Nickar. 3. Smooth Guilandina, with doubly winged leaves. 4. Smooth Guilandina, with winged leaves, whose under small leaves are trifoliate, called Morunga. 5. Guilandina, with smooth branches, doubly winged leaves, but those at the top and bottom singly winged, commonly called Canada Nickar-tree.

The first and second species grow naturally in most of the islands in the West-Indies, where they twine their stalks about any neighbouring support, and rise to the height of twelve or fourteen feet. The leaves of the first sort are near a foot and a half long, composed of six or seven pair of pinnæ, or wings, each of which has as many pair of lobes, or small leaves, set along the mid-rib; these are oval and entire. The foot-stalk, or principal mid-rib of the leaf, is armed with short, crooked thorns, which are placed irregularly; the stalks are also closely armed with the like thorns, which are larger. The stalks at first grow erect, but as they advance, twine about any support which is near them, being too weak to stand without it. The flowers are situated at the wings of the stalks, in long spikes; they are composed of five concave, yellow petals, which are equal; in the center is situated the oblong germen, surrounded by ten stamina. After the flower is past, the germen becomes a pod about three inches long, and two broad, closely armed with slender spines, opening with two valves, each inclosing two hard seeds, about the size of a small hazel-nut, of a yellowish colour.

The second sort differs from the first, in having much smaller leaves, which are set closer together; and below each pair of lobes are placed two short, stiff, crooked spines, which are placed opposite; the flowers are of a deeper yellow colour than those of the first sort, and the seeds are of an ash colour.

The third species has an upright stem, of a large size, divided into many branches. The leaves are smooth, doubly-winged, and placed opposite; they are oval, but end in a point, and are of a light green colour.

The fourth sort grows naturally in the island of Ceylon, and in several places on the Malabar coast. This, where it is a native, rises to the height of twenty-five or thirty feet, with a strong stem, covered with a smooth bark, which in the young branches is green, but on the older it is of an ash colour. The root is knobbed and very thick, this, when young, is scraped and used by the inhabitants as Horse-radish in Europe, having much the same hot taste. The branches are decorated with winged leaves; those which are situated at the base have but three leaves: but above, the leaves are branched out into several divisions, which are again divided into smaller, which have five or six pair of oval lobes, terminated by an odd one: they are of a light green, and a little hoary on their under side. The flowers are produced in loose bunches from the sides of the branches, composed of an unequal number of petals, from five to ten; they have ten short stamina surrounding the germen, which afterwards turn to a long taper pod, including several angular seeds, covered with a thin membrane; these have a flavour like the root.

The fifth sort is a native of Canada, where it rises with an erect stem to the height of thirty feet or more, dividing into many branches, which are covered with a bluish, ash-coloured bark, very smooth. The leaves are large, winged, of an oval shape, very smooth, and entire, but are ranged alternate on the mid-rib; these fall off in autumn, and new ones come out late in the spring.

Culture of the GUILANDINA.

The four first species, being natives of warm countries, will not live through the winter in our climate, unless they are plunged into the tan-bed in a warm stove. They are propagated by seeds; but those of the two first sorts are so hard, that unless they are soaked two or three days in water, before they are put into the ground, or placed under the pots in the tan-bed, to soften their

covers, they will remain years in the ground without vegetating.

When the plants come up they will be fit to remove in a short time, when they should be transplanted each into a separate small pot, and plunged into a moderate hot-bed of tanners-bark, shading them till they have taken fresh root; after which they must be treated in the same manner as other tender exotics, giving them a large share of air in warm weather, and but little water. When the plants are grown too high to remain any longer in the frames, they must be removed into the bark-stove, and plunged into the hot-bed, where they will make great progress, provided they have not too much water, especially during the winter season; for much moisture in cold weather would injure the plants greatly.

The fifth species is propagated by cutting off some of the roots and planting them in pots, which should be plunged into a gentle hot-bed, which will cause them to shoot upward, so may be taken from the old root and multiplied. It requires a light soil, not too moist, and will live abroad in the open air, as they are never hurt by frost.

GUNDELIA, a genus of plants, for which there is no English name.

There is but one species of this genus, of which there are two varieties. 1. Eastern Gundelia, with prickly bear's-breech leaves, deep purple flowers, and a head covered with a down, like a cobweb. 2. Eastern Gundelia, with a prickly bear's-breech leaf, and a smooth head.

This plant is a native of several places in the Levant. The stalks seldom rise more than two feet high. The under leaves are long, narrow, and sawed on their edges, their teeth ending in a spine; the other leaves are broader, and irregularly slashed to the mid-rib, and armed at the points with sharp prickles. The stalks divide upward into several branches, and each is terminated by a conical head of flowers, resembling those of Fuller's Thistle, being surrounded at the base by a circle of long, narrow, prickly leaves.

Culture of the GUNDELIA.

These plants are propagated by seed, which should be sown the beginning of March in a warm border of fresh earth, in the place where the plants are designed to remain; for these plants having top-roots, which run very deep in the ground, will not bear transplanting.

When the plants come up, they must be carefully cleared from weeds; and as they grow large, they should be thinned, leaving the plants, which are designed to remain, about two feet asunder, that they may have room to spread; after this they only require to be kept clean from weeds. In about two years the plants will produce their flowers, which make a fine appearance among other hardy plants in the pleasure-garden. The roots will continue several years in a dry soil.

XX

H.

HARDBEAM. See the article **HORNBEAM**.

HARE-BELL, a species of Hyacinth, which grows naturally in woods, and near hedges in several parts of England, so is seldom admitted into gardens.

HARE'S EAR, *Bupleurum*, a genus of plants, ranged by Linnæus among the *pentandria digynia*, and of which he enumerates thirteen species, but of these, two only are cultivated, except in botanic gardens for the sake of variety, viz: 1. Shrubby Hare's Ear, with oblong, oval, entire leaves, commonly called Shrubby Ethiopian Hartwort. 2. Shrubby Hare's-Ear, the spring leaves of which are decomposed, plain, and cut, and the summer leaves thread-shaped, angular, and trifid.

The first species has a woody stem, which sends out many branches on every side, so as to form a large head

H A R

or bush. The leaves are stiff, smooth, oblong, oval, and of a sea-green colour. The ends of the branches are terminated by umbels of yellow flowers. This shrub rises to the height of five or six feet, forming a large regular bush, which makes an elegant appearance; and the leaves continuing green throughout the year, renders it very valuable.

The second species is a native of the Cape of Good Hope; it rises with a shrubby stalk to the same height as the former, sending out some side branches, which in the spring have their lower parts decorated with leaves composed of many small plain lobes, which are finely cut, and of a fine sea-green colour; these leaves soon fall off, and the upper part of the branches are closely covered with long rush-like leaves, having four angles, which come out in clusters from each joint. The flowers grow in spreading umbels at the extremity of the branches, which are small and of an herbaceous colour, and are succeeded by oblong channelled seeds.

Culture of the HARE'S-EAR.

The first species is propagated by cuttings, which should be planted in pots, and in winter sheltered under a hot-bed frame. In the spring the cuttings will put out roots, but they will not be fit to transplant till the autumn following; therefore the pots should be placed in a shady situation in summer.

The young plants may be planted in a nursery bed at two feet distance, for a year or two, till they get strength, and then transplanted where they are to remain. The most proper place for them is among ever-green shrubs of the same growth, where they will make an agreeable variety.

The second species is also propagated by cuttings, which in April must be planted in pots, and plunged into a moderate hot-bed, where they will soon take root, after which they should by degrees, be inured to the open air; and after having obtained strength, they may be planted each into a separate pot, observing to place them in the shade till they have taken fresh root, when they may be placed with other exotic plants in a sheltered situation, where they may remain till the autumn, when they must be removed into the green-house, and placed with such hardy plants as require a large share of air in mild weather, and only require protection from the frost.

HARTWORT, *Tordylium*, a genus of plants, ranged by Linnæus among the *pentandria digynia*, and of which there are seven species. 1. Hartwort, with the involucre longer than the umbels. 2. Hartwort, with the partial involucre of the length of the petals, and with oval, jagged lobes. 3. Hartwort, with the umbels growing at a distance, winged leaves, with the lobes roundish and jagged. 4. Hartwort, with the rays of the umbel closed together, and the lobes of the leaves spear-shaped and cut like saws. 5. Hartwort, with almost naked umbels closed together, winged leaves, and the lobes of the leaves spear-shaped, and cut like saws. 6. Hartwort, with closed umbels, and oval, spear-shaped, wing-pointed lobes; or Hedge Parsley. 7. Hartwort, with single sessile umbels, and the outer sides of the seeds prickly; or Knotted Parsley.

All these species are natives of Italy, and other parts of Europe.

Culture of the HARTWORT.

They are all propagated by seeds, which should be sown in autumn, soon after they are ripe, when the plants will soon appear, and are very hardy, so that they require no farther care, but to keep them clean from weeds; and where they come up too close together, they should be thinned, so as to leave them six inches asunder. In June following the plants will flower, and their seeds will ripen in autumn, which, if permitted to scatter on the ground, will produce a supply of plants without any trouble.

These plants will grow on any soil or situation, so may be put into any obscure part of the garden.

Shrubby Ethiopian HARTWORT, a species of Hare's-ear. See the article **HARE'S-EAR**.

HATCHET-VETCH. See the article **CORONILLA**.

H A W

HAWKWEED, *Hieracium*, a genus of plants, ranged by Linnæus among the *syngenesia polygamia equalis*, and of which there are twenty-six species: few of them are admitted into gardens; among the most beautiful of those which are allowed a place, there is the Orange Hawkweed, sometimes called Golden Mouse-ear, and by some Grim the Collier.

The root is oblong, purplish at the head, white below, and hung with many thick fibres; besides these, it sends out every way a kind of tendrils, which take root again at their ends, and spread and propagate it abundantly. The leaves are numerous and large: their colour is a deep, blackish green, and they are covered with firm and stiff whitish hairs: they are oblong, undivided, and of a moderate breadth. The stalk is simple, upright, round, and almost naked: a single, small leaf, sometimes adheres to it, rarely more. Its colour is a paler green than that of the leaves, and it is covered with the same kind of hairyness: it does not divide into branches, but at the top spreads out into a tufted head of flowers. The bottom of the hairs, which cover the stalk, are black, and they appear at a distance as so many black spots upon its surface; the height of the stalks is a foot and a half, and the crown of flowers at its summit is often five inches in diameter; but where there are fewer of them they are finer. Each flower is surrounded by a rough, blackish cup, and is itself rounded, radiated, and of a very fine orange colour. One flower always shews itself upon the plant, and passes through its state of perfection, before the others open; this is the most perfect and most beautiful: from this the seeds should be saved. The cup is thick, and composed of many narrow and unequal scales, placed lengthways, and incumbent; in this stands the general flower, which is composed of many floscules, laid in a regular manner, one over another, and all of the same structure. Each floscule is formed of a single petal, and is flat, narrow, and when perfect, cut in five places at the end. To each of these floscules belong the male and female parts of impregnation; the male parts are five very short filaments, with oblong and tubulated buttons, growing together in form of a cylinder; the style is simple, of the length of the filaments, and has a double head, the two parts of which are equal; this rises from the rudiment of the seed, which, when it ripens, is winged with down.

Culture of the Orange HAWKWEED.

It may be propagated by seeds sown in March, upon a border, with an aspect to the east. The plants, when come up, must be kept clean from weeds; and when they are strong enough to be removed, which they will be about the beginning of June, let them be transplanted into a shady border of undunged ground, at the distance of six inches asunder. If the weather should prove dry, let them be watered till they have taken new root; after which, if they are kept clean from weeds, they will require no other culture. In the autumn they should be transplanted where they are designed to remain; the following summer they will flower, and produce ripe seeds; and the roots will continue some years, if they are not planted in a rich or moist soil; they may be also propagated by off-sets, or parting of the roots in autumn. After this, they will increase fast by the root; but as the propagation by seed is so easy, it is best to do it every year, for the flowers never are so perfect as on the first blowing.

The same culture is proper for every species of this genus, which is admitted into gardens.

Bastard HAWKWEED, *Crepis*, a genus of plants, ranged by Linnæus among the *syngenesia polygamia equalis*, and of which there are four species. 1. Bastard Hawkweed, with a Dandelion leaf, and a soft red flower. 2. Bastard Hawkweed, with hairy, wild succory leaves, smelling like Castor. 3. Bastard Hawkweed, with flowers black in the middle; or Spanish Hawkweed. 4. Bastard Hawkweed, with a Viper's-grass leaf; or Alpine Hawkweed.

There are several other species of this genus, some of which grow naturally in England, and others are weeds in different parts of Europe.

The first species is a native of Apulia; it has many spear-shaped leaves, which spread on the ground, and are deeply jagged on their sides; between these rise the branching stalks, which grow a foot and a half high. The leaves are oblong, deeply indented on their edges, and embracing the stalks with their base. These stalks are each terminated by one large radiated flower, of a soft red colour, composed of many half florets, which are succeeded by oblong seeds, crowned with a feathery down. It is an annual plant.

The second species grows naturally in the south of France, and in Italy. This is a biennial plant, and sometimes, when it is in poor ground, it will continue longer. It has a thick top root, which strikes deep into the ground, sending out many small fibres. The lower leaves are from four to five inches long, and about a quarter of an inch broad, having several deep jaggs on their edges. From the root rise four or five stalks, which grow about ten inches high; the leaves on the lower part of these are of the same form with those at the root, but are smaller, and more jagged. The upper part of the stalks are naked, and terminated by one flower, of a beautiful gold colour, composed of many florets, which are included in a single empalement. The flowers are succeeded by oblong, narrow seeds, crowned with a feathery down.

The third species is a native of Spain; this is an annual plant: it puts out leaves near the root, which are nine inches long, and almost two broad in the middle; they are of a light green, and a little jagged on their edges. The stalks rise a foot and a half high; the leaves are of the same form as those at the bottom, but are smaller. The flowers are produced at the ends of the branches; these have a double empalement, composed of many long, and very narrow leaves; the outer series are reflexed downward, and turn upward again, and are inflexed at their extremities; the flowers are composed of many florets, which spread regularly in form of rays, situated over each other like scales of fish; the center is black, which gives them an elegant appearance in a garden.

The fourth species grows naturally on the Alps; this is also an annual plant, which sends out many leaves near the root five inches long, and almost two broad at their base; the upper parts of these are slightly indented, but their lower are entire. The stalks are strong, upright, rising two feet high, and are terminated by pale white flowers, inclosed in a strong hairy empalement.

Culture of the Bastard HAWKWEED.

All these species are propagated by seeds, which should be sown in the spring, on the borders of the flower-garden, where they are designed to remain, so that if six or eight seeds are sown in each patch, when the plants come up, they may be reduced to three or four; and if these are kept clean from weeds, they will require no other culture.

If the seeds are sown in autumn, or permitted to scatter, the plants will come up, and live through the winter without shelter, and will flower early in the spring.

HAUTBOY, a species of the Strawberry. See the article **STRAWBERRY**.

HAWTHORN, a species of the Medlar. See **MEDLAR**.

HAZEL, or **NUT-TREE**, *Corylus*, a genus of plants, ranged by Linnæus among the *monoetia polyandria*; and of which there are three species. 1. Wild Hazel-Nut. 2. The Filbert. 3. Byzantine Nut.

The first of these species is common in the woods in most parts of England, and therefore seldom planted in gardens.

The second species is by some supposed to be only a seminal variety from the first; of this there are the red and white Filberts, both which are so well known, that they need no description.

The third species grows naturally near Constantinople. the common Hazel, but are more than twice their size; The nuts of this are large, roundish, and in shape like

the cups in which the nuts grow are very large, so as nearly to cover the nut, and is deeply cut at the brim.

Culture of the HAZEL, or NUT-TREE.

All these species may be propagated by suckers, but the best method is by laying down their branches, which, in one years time will take sufficient root for transplanting; and these will be much handsomer, and better rooted plants than those raised from suckers; and will greatly outgrow them, especially while young.

They may also be propagated by sowing their nuts in February, which in order to preserve them good, should be kept in sand in a moist cellar, where they are secure from vermin; but great care should be taken not to exclude the external air from them, which would occasion their growing mouldy.

Witch HAZEL, *Hamamelis*, a genus of plants, of which there is but one species.

This plant is a native of North America. It rises with a woody stem from two to three feet high, sending out many slender branches. The leaves are oval, indented on their edges, and bear a great resemblance to those of the Hazel; these fall away in the autumn, and when the plants are destitute of leaves, the flowers come out in clusters from the joints of the branches. These sometimes appear the latter end of October, and often not till December. They are not succeeded by seeds in this country.

Culture of the Witch HAZEL.

It is propagated by laying down the young branches in autumn, which will take root in one year, and may then be taken from the old plants, and placed where they are to stand.

The seeds of this plant always remain a year in the ground, they should therefore be sown in pots, which must be plunged into the ground in a shady part of the garden, where they may continue all the summer, and will require no other care but to keep the pots clean from weeds, and to water them at times, in very dry weather. In autumn the pots may be removed to a warmer situation, and plunged into the ground, under a hedge; and if the winter should prove very severe, they must have some light covering thrown over them, which will secure the seeds from being destroyed.

In the spring the plants will come up, and as the season advances, the pots may be removed where they may have the morning sun till eleven o'clock. In the autumn they should be transplanted either into small pots, or into a nursery bed, where in one, or at most two year's time, they will be strong enough to plant where they are designed to remain. They delight in a moist soil, and a shady situation.

HEART'S-EASE, or **PANSIES**, a species of Violet, which grows naturally in some of the northern counties of England, but by culture, has been brought to great perfection, and several varieties obtained, which differ greatly in the size and colour of their flowers.

Some of these varieties have very large beautiful flowers, which have an agreeable odour, and others have small flowers, without scent.

Some of them have the two upper petals of a deep yellow, with a purple spot in each, the two middle of a paler yellow, with a deep yellow spot, and the lower petal of a dark purple; in others the petals are white, with yellow and purple spots; in some the yellow is the most prevailing colour, and in others the purple.

Culture of the HEART'S-EASE.

These plants, if permitted, will scatter their seeds soon after the flowers are past, and from these self-sown seeds the plants, which come up in autumn, will flower very early in the spring, and will be succeeded by the spring plants; so that where they are encouraged in a garden, there will be a constant succession of their flowers the greatest part of the year; for in mild seasons, they will flower all the winter, and, in shady situations, most part of the summer, which renders them worthy a place in every good garden: but they must be prevented spreading too far, lest they become troublesome weeds; for their seeds, when ripe, are cast out of their covers

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with great elasticity to a considerable distance, and the plants will soon spread over a large space of ground, if they are permitted to stand.

HEBENSTRETIA, a genus of plants ranged by Linnæus among the *didymia angiospermia*, and of which there are two species. 1. Hebenstretia with dentated leaves. 2. Hebenstretia with undivided leaves.

Both the species are natives of Africa. The root of the first is white and fibrous. The stalks are numerous, and grow irregularly. Some lean upon the ground, and others are spread without order over the surface; but those in the midst usually rise tolerably erect, and are a foot and a half in height. They are round, tender, purple at the bottom, green toward the top, and not much branched. The leaves are numerous, and placed irregularly: they have no footstalks, and their colour is a lively green, often tinged with purple. Those from the root are deeply divided, those on the lower part of the stalk sharply dentated, and such as grow toward the top not at all serrated. The flowers are small, but their disposition renders them conspicuous. They stand in long spikes at the tops of all the branches. Their colour is a pure and perfect white, but in the centre there is a spot of a fine glowing red. Each flower is placed in a cup formed of two segments, divided in the manner of lips, the lower of which is irregularly shaped, and much longer than the other. The flower itself is formed of a single petal, tubular at the base, and divided at the extremity in four places: it runs up in form of a single lip, answering to the under lip of the cup. From the sides of the lip, toward the lower part, spring four filaments, crowned with their buttons; they are all short, but two of them are somewhat longer than the others; and from the base rises a single stile.

The root of the second species is brown, long, and spreading. The stem is woody but does not exceed fifteen inches in height; it is divided into many branches. The bark is brown upon the lower part, but the young shoots are green. The leaves stand irregularly, and in great numbers upon the branches: they grow upright, and form a kind of absolute covering for them of considerable thickness, they are oblong, very narrow, and adhere to the branches without footstalks. Their colour is a fresh and fine green. The flowers grow in long regular spikes at the tops of all the branches, and are small and white. Each has its cup, small but particular in structure: it is formed of one piece divided into two lips, and tubular at the base. The upper lip is small, narrow, and erect; the under longer and bent down. One petal forms the flower: it is tubular at the base and at the top cut into four parts; these make a sort of upper lip, the lower lip of the cup serving in place of a lower one. The filaments are four, and they rise from the two sides of the lower part of the flower; two of these are shorter than the others. The buttons are oblong and lateral. The style is single, and has a fine small head; and there follows an oblong seed-vessel, containing two seeds.

Culture of the HEBENSTRETIA.

The first species is propagated by seeds either imported from Africa or ripened here. Before these are sown, the following compost should be prepared. Fresh mould from a hilly pasture, with a mixture of wood-pile earth, and clean sand, of each one fourth the quantity of the mould; let this be well mixed and laid in a heap till the plants are fit for potting.

Early in the spring sow the seeds on a hot-bed, when the plants are come up, transplant them on a second hot-bed; when they have got a little strength they must be planted into pots filled with the above compost, and by degrees inured to the air. When they have acquired a sufficient growth they may be set out among the green-house plants, and removed into shelter in autumn.

When the plants have been thus raised, they may be farther propagated by parting of the roots; but this method is much inferior to the former, for it does not afford either so large, or so handsome plants as those raised

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from seeds, and another great disadvantage attending it is, that for several seasons they blow weakly and poorly. Bad management will also lose the spot in the flower.

The second species is also raised from seeds, which in spring should be sown in pots, filled with the compost directed for the first sort, and plunged into a bark-bed. When the plants are large enough to be taken up, each must be planted in a pot of the same mould, and again set up to the rim in the same bed till well rooted: then, by degrees, they must be inured to the air, by admitting it in the middle of the day; and when they can bear it, they must be set out among the green-house plants, and housed with them in winter.

The second year they will flower; and if all the branches are permitted to grow as nature throws them out, the plant will form a very pretty bush, and the top covered with flowers. These have a singularity about them, which never fails to attract the eye; and gives a variety beyond most others.

This species may likewise be propagated by cuttings, which should be shoots of the same year. The proper time for planting them is in July, in a bed of the same compost. As soon as they are planted, give them a gentle watering, and close the earth well about them, this will soon give them a tendency to rooting, and with the advantage of a shelter of canvas drawn over hoops, they will be so well rooted in seven weeks, that they may be taken up and planted in separate pots. These must be set under the same shelter till they are well established; and then they are to be placed out among the green-house plants.

H E D G E S, are either planted to make fences round inclosures, or to divide the several parts of a garden.

When they are designed as outward fences, they are planted either with Haw-thorn, Crabs or Black-thorn; but those hedges which are planted in gardens, either to surround wilderness-quarters, or to screen the other parts of a garden from sight, are planted according to the fancy of the owner, some preferring evergreens, in which case the Holly is best; next the Yew, then the Laurel, Laurustinus, Phillyria, &c. others prefer the Beech, the Hornbeam, and the Elm. Before planting, it is proper to consider the nature of the land, and what sort of plants will thrive best in it; and also, what is the soil from whence the plants are to be taken. As for the size, the sets ought to be about the bigness of one's little finger, and cut within about four or five inches of the ground; they ought to be fresh taken up, straight, smooth, and well rooted.

Those plants that are raised in the nursery are to be preferred. In planting outside hedges, the turf is to be laid with the grass-side downwards, on that side of the ditch the bank is designed to be made, and some of the best mould should be laid upon it to bed the quick, which is to be set upon it a foot asunder.

When the first row of quick is set, it must be covered with mould, and when the bank is a foot high, you may lay another row of sets against the spaces of the former, and cover them as you did the others: the bank is then to be topped with the bottom of the ditch, and dry or dead hedge laid, to shade and defend the under plantation.

Stakes should then be driven into the loose earth, so low as to reach the firm ground; these are to be placed at about two feet and a half distance, and in order to render the hedge yet stronger, you may edder it, that is bind the top of the stakes with small long poles, and when the edging is finished, drive the stakes anew. The quick must be kept constantly weeded and secured from being cropped by cattle; and in February it will be proper to cut it within an inch of the ground, which will cause it to strike root afresh, and help it much in the growth.

When an hedge is about eight or nine years growth, it will be proper to plash it, for the method of doing which see the article **PLASHING**.

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The Crab is frequently planted for hedges and if the plants are raised from the kernels of the small wild Crabs, they are much to be preferred to those raised from the kernels of all sorts of Apples without distinction; because the plants of the true small Crab never shoot so strong as those of the Apples, and may therefore be better kept within the proper compass of an hedge. The Black-thorn or Sloe is frequently planted for hedges; and the best method of doing it, is to raise the plants from the stones of the fruit, which should be sown about the middle of January, if the weather will permit, in the place where the hedge is intended; but when they are kept longer out of the ground it will be proper to mix them with sand, and keep them in a cool place. The same fence will do for it when sown, as when it is planted for hedges; but where it is exposed, there will be great difficulty in preventing its being destroyed, otherwise it is by far the most beautiful plant, and being an evergreen will afford much better shelter for cattle in winter, than any other sort of hedge. The best way of raising these hedges, is to sow the stones in the place where the hedge is intended, and where this can be conveniently done, the plants will make a much greater progress than those that are transplanted; but these berries should be buried in the ground several months before they are sown.

The method to do this is to gather the berries about Christmas, when they are usually ripe, and put them into large flower-pots, mixing some sand with them, then dig holes in the ground into which the pots must be sunk, covering them over with earth about ten inches thick. In this place they must remain till the following October, when they should be taken up, and sown in the place where the hedge is intended to be made. The ground should be well trenched, and cleared from the roots of all bad weeds, bushes, trees, &c. Then two drills should be made, at about a foot distance from each other, and about two inches deep, into which the seeds should be scattered pretty close, lest some should fail. When the plants grow up, they must be carefully weeded, and if they are designed to be kept very neat, they should be cut twice a year, that is in May and in August; but if they are only designed for fences, they need only be sheered in July.

The fences for these hedges, while young, should admit as much free air as possible: the best sort are those made with posts and rails, or with ropes drawn through holes made in the posts; and if the ropes are painted over with a composition of pitch, brown Spanish colour and oil, well mixed, they will last several years.

Hedges for ornaments in gardens are sometimes planted with ever-greens, in which case the Holly is preferable to any other. Next to this most people prefer the Yew, but the deadly colour of its leaves renders these hedges less agreeable. The Laurel is one of the most beautiful ever-greens, but the shoots are so luxuriant that it is difficult to keep them in any tolerable shape, and as the leaves are large, to prevent the disagreeable appearance given them by their being cut through with the sheers, it will be the best way to prune them with a knife cutting the shoots just down to a leaf. The Laurustinus is a very fine plant for this purpose, but the same objection may be made to this as to the Laurel; this, therefore, ought only to be pruned with a knife in April, when the flowers are going off; but the new shoots of the same spring must by no means be shortened.

The small-leaved and rough-leaved Laurustinus are the best plants for this purpose. The true Phillyria is the next best plant for hedges, which may be led up to the height of ten or twelve feet, and if they are kept narrow at the top, that there may not be too much width for the snow to lodge upon them, they will be close and thick, and make a fine appearance.

The Ilex or evergreen Oak, is also planted for hedges, and is a fit plant for those designed to grow very tall.

The deciduous plants usually planted to form hedges

in gardens, are the Horn-beam, which may be kept neat with less trouble than most other plants. The Beech, which has the same good qualities as the Hornbeam; but the gradual falling of its leaves in winter cause a continual litter. The small-leaved English Elm is a proper tree for tall hedges, but these should not be planted closer than eight or ten feet.

The Lime-tree has also been recommended for the same purpose; but after they have stood some years they grow very thin at bottom, and their leaves frequently turn of a black disagreeable colour.

Many of the flowering shrubs have also been planted in hedges, such as Roses, Honeysuckles, Sweetbriar, &c, but these are difficult to train, and if they are cut to bring them within compass, their flowers which are their greatest beauty, will be entirely destroyed.

HEDGE-HOG, a species of Snail Trefoil. See the article SNAIL TREFOIL.

HEDGE Hyssop, See Hedge Hyssop.

HELIOCARPUS, a genus of plants for which there is no English name, and only one species.

This plant rises with a thick, soft, woody stalk, from fifteen to eighteen feet high; and toward the top it sends out several lateral branches. The leaves are heart-shaped, full of veins, sawed on their edges, and ending in acute points. The flowers are produced at the end of the shoots in branching clusters; their colour is a yellowish green. They are succeeded by flat compressed seed-vessels of an oval shape, whose borders are closely set with threads, representing rays, of a brownish colour when ripe. These capsules are divided into two cells by an intermediate partition, in each of these is lodged a single roundish seed ending in a point.

Culture of the HELIOCARPUS.

This plant is propagated by seeds, which must be sown upon a hot-bed in the spring; and when the plants are fit to remove they should be each planted in a separate small pot, and plunged into a hot-bed, treating them in the same way as other tender plants.

While the plants are young, they require to be plunged, but after they have acquired strength, they will thrive in the dry stove: in winter they should have but little water, and be kept warm; but in summer they should have plenty of fresh air in fine weather, and must be frequently refreshed with water. With this management the plants will flower the third year, and produce good seeds; and with proper care may be preserved several years.

HELIOTROPE, *Turnsole*, a genus of plants ranged by Linnæus among the *pentanaria monogynia*, and of which there are five species. 1. Heliotrope with rough, oval, heart-shaped, pointed leaves, and with single spikes and divided fruit, or Indian Heliotrope. 2. Narrow-leaved Heliotrope with conjugate spikes, and smooth veinless leaves, or white Indian Heliotrope. 3. Heliotrope with oval, intire, woolly, rough leaves and conjugated spikes. 4. Heliotrope with oval, intire, woolly, plaited leaves, and single spikes. 5. Heliotrope with narrow, smooth leaves, without veins, and lateral sparse flowers.

The first and second species are the most beautiful; the culture of these is proper for the third sort; and as to the fourth and fifth, being plants of no beauty, they are seldom admitted into any other than botanic gardens.

Indian HELIOTROPE. This is an erect, robust, and rugged plant. The root is long, white, woody, slender, acrid in taste, and hung about with many fibres. The stalk is four feet high, ridged, hairy, with thickset bristles, of a greenish white toward the bottom, but from the middle upwards stained with a florid crimson. The leaves are large, standing irregularly, and have long footstalks, hollowed and winged; it is broadest at the base, where it has a heart-like indenting for the stalk, thence it grows smaller to the extremity, where it is pointed; the edge is regularly waved and sinuated, and the whole surface of the leaf is curdled up, and rough. Naturally the ribs and edges of those leaves which hang upon

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upon the upper part of the stalk are purple, the rest of a dusky green; but often when the plant is exposed to the full sun, the purple spreads itself over the whole leaf and its footstalk; and the plant, even before it flowers, has a rich glowing aspect.

The flowers are not very large, but from their manner of growth very conspicuous. They are disposed in double series along one side of long slender footstalks, which at their ends curl in a spiral line, and have been supposed to resemble a scorpion's tail. Each flower is supported on a very short footstalk upon the common branch, but they stand so thick this is scarce seen.

When the plant is properly encouraged, the flowers are of a very delicate purple, much upon the blue; and as the soil and culture suit the plant more or less, they will be more upon the red cast or more upon the blue; but when they have this true blueish purple, they are in their greatest perfection.

The cup is formed of a single piece, divided at the edge into five segments; and the body of the flower is formed of a single petal; this is tubular at the base, and divided at the rim into five irregular, unequal and obtuse segments. The opening to the tube is closed by five small scales, which converge at the point, and form a kind of star. In this part of the flower are placed the filaments: they are five, very small, and topped with little buttons. The style is single, it rises in the midst from a four-parted rudiment, and when the flower is fallen, four seeds ripen in the cup naked.

Culture of this HELIOTROPE.

This plant is an annual, and propagated by seeds, which should be sown in pots, filled with the following compost.

Wash some coarse pit-sand till the water runs from it without colour, set it over the fire in an iron pot, and let it be well heated: when it is sufficiently so, it will acquire a reddish hue. Mix a bushel of this with five pecks of marle, and add one peck of black meadow earth: sprinkle in a little foot, and a handful of salt, and let it lie in a heap for some time, exposed to the weather.

In February fill some pots with this, and scatter upon it a little very rich mould, about a quarter of an inch thick; upon this strew the seeds, and sift over them a little of the compost: sprinkle the surface with water, and set the pots up to the rim in a bark-bed.

When the young plants come up, give them a little water, and as soon as they have strength for removing, transplant them each into a separate pot of the compost; let these be pots of a middling size, for the plants are not to be removed any more. Settle the earth to their roots by a gentle watering, with water that has stood in the bark-bed or stove, and then set in the pots again up to the rim. Shade the bed with mats till they are well rooted, and then by degrees inure them to the air. In the beginning of June they may be finally set out, and for this purpose a place should be chosen open to the full sun.

Hitherto the plants will be green, or but little tinged; but from the time they are exposed to the full sun, they will begin to change their colour. the tenderer leaves will be blotched and spotted with crimson, the others of a paler red, extremely singular and pleasing. They will flower here, and seeds must be carefully saved.

The plant is so singular that it is worth preserving through the winter; and this is to be done by preventing its flowering, and defending it from cold. If one or two of them be transplanted two or three times, during the beginning of the summer, and the heads cut off when the buds of the stalks for flowering appear, the plants being removed at the approach of winter into the stove, will live throughout that season, and flower early in the spring.

White Indian HELIOTROPE. The root of this plant is composed of numerous white fibres, connected to a small head. The stalk is round, smooth, of a greyish green, and ten inches high. The leaves stand in pairs; they are oblong, narrow, undivided at the edges, obtuse, smooth, fleshy, and of a blueish green.

The flowers terminate the stalk in a double spike, turning down and curling back each way, and numerous

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others rise from the bosoms of the leaves; they are small and white, and at evening have a very fragrant smell. Each has its little cup formed of one leaf, tubular at the base, and cut into five small segments at the edge.

The flower is formed of one petal: this is tubular at the base, and at the rim is cut into five obtuse segments: and the opening at the top is covered by five convergent scales. The filaments are five; they are very short, they stand in the mouth of the flower, and have small covered buttons. The style is single, and four naked seeds follow: the cup is their only defence.

Culture of this HELIOTROPE.

This plant is a native of the warmer parts of the West-Indies, lives on the sandy shores, and is annual.

This directs our culture. Let seeds be procured from its native country, and sown in a pot of some light compost, mixed with one third part sand, and wetted with a little brine. Let the pot be set up to the rim in a bark-bed; and when the young plants are three inches high, they must be transplanted into separate pots. They must be watered and shaded till they have taken root, and afterwards brought into the stove. With good management they will ripen seeds here: but the best plants are produced from those brought from the native place.

Black HELLEBORE, Helleborus, a genus of plants, ranged by Linnæus among the *polyandria polygynia*, and of which there are five species. 1. Black Hellebore, with the flower sitting on the leaf; or the common Winter Aconite. 2. Black Hellebore, with the flower-stalk almost naked, and with the main foot-stalk of the leaf divided into two parts; or the true Black Hellebore, called Christmas Rose. 3. Black Hellebore, with many flowers on a leafy stalk, intermixed with finger-shaped leaves; or Bear's-foot. 4. Black Hellebore, with many flowers on a leafy stalk, intermixed with leaves on foot-stalks; or the stinking Black Hellebore, called also Bear's-foot, or Setterwort. 5. Black Hellebore, with trifoliate leaves, and one flower on a stalk.

The first species is too well known to need any description, being the common Winter Aconite. It flowers very early in the spring, which renders it worthy a place in every curious garden, especially as it requires very little room.

The second species, known by the name of the Christmas Rose, is a plant which rises to no great height. The root is composed of innumerable thick, black fibres, long, tough, and variously entangled, rising from a small head, and spreading every way to a vast distance. The leaves are large and numerous, and are divided in that coarse fingered manner, which modern botanists term pedated. The foot-stalk is thick, short, and juicy: it usually rises slanting, and is of a fresh green; when the plant is in full perfection, it is stained with red, in various and irregular little spots. The leaves are placed on its divided top, and forming what is called the entire pedated leaf, are usually nine; they are oblong, broad, of a strong green, and of a very firm substance, indented round the edges, on their extreme part, but perfectly entire below, and often cut into a small point at the end. The divisions of the foot-stalk at the end are always coloured, either reddish or brownish; and in the best condition of the plant, these, and the main rib on the back of the leaf, are purple.

The flowers appear among the leaves, each on its separate stalk, and these scarce longer than those of the leaves, but the size of the flower renders it very conspicuous. The stalk is fleshy, round, of a pale green, and elegantly spotted with crimson; it is rarely quite upright, not from the weight of the flower bending it, but from winds and severe seasons. There grows no proper leaf upon this stalk, but close under the flower there is a filmy substance, and sometimes below this another; these serve in some degree, as a defence to the young flower. The flower is about the size of a single rose, expanded, white, or variously stained with crimson. Sometimes the white is perfect, and at others the red is shewn throughout; but in the most elegant state, the two colours are mixed, the red being most predominant on the outside of the flower. In the centre are numerous
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filaments, supporting yellow buttons, and from the base rise up a kind of horns, which shew their curled tops above the cluster, and are of a pale green. Round about the filaments, are numerous open cups, as it were, of a strong green, tipped with gold.

The third species grows naturally in Cambridgeshire and Oxfordshire. The stalks rise about two feet high. The leaves are composed of nine long lobes, which unite to the footstalk at their base, they are sharply sawed on their edges, and of a light green. The flowers are produced at the top of the stalk; they are composed of five oval green petals, with a great number of stamina surrounding the germen situated in the middle; these appear the beginning of February, and the seeds ripen the end of May.

The fourth species grows naturally in several parts of England. It rises with a jointed herbaceous stalk two feet high, divided into two or three heads. The leaves are composed of eight or nine long narrow lobes, which join at their base; they are sawed on their edges, and end in acute points; those on the lower part of the stalk are much larger than the upper which are small and narrow. The flower-stalk rises from the centre of the plant dividing into many branches, each have several smaller footstalks, with one entire spear-shaped leaf upon each, and one large greenish flower at the top with purplish rims; these appear in winter, and the seeds ripen in the spring.

The fifth species grows naturally in Canada and Siberia. It rises about two feet and a half high, having broad trifoliate leaves. This plant flowers early in winter, but is very seldom to be met with in England.

Culture of the Black HELLEBORE.

The first species is propagated by off-sets, which the roots send out in great plenty. These roots may be taken up and transplanted any time after their leaves decay, which is generally by the beginning of October, when they will begin to put out new fibres; but as the roots are small, and nearly of the colour of the ground, if great care is not taken many of them will be lost.

These roots should be planted in small clusters, otherwise they will not make a good appearance, for single flowers of these small kinds scattered about the borders, are scarce seen at a distance; but when these and the Snowdrops are alternately planted in bunches, they will have a good effect, as they flower at the same time, and are much of the same size.

The second species may be propagated by seeds; but the most expeditious method is by parting of the roots, which should be done about the beginning of May, and planted out at eighteen inches distance in a border which is exposed to the morning sun only; after this they will only require to be kept free from weeds, and watered at times, and they will flower the succeeding season.

The third species is propagated by seeds which should be sown in May soon after they are ripe, and the plants will come up early the following spring, and when they have obtained strength may be planted in shady places under trees, where they will thrive and flower very well.

If the fourth species is permitted to scatter its seeds when ripe, the plants will rise without care, and may be transplanted into woods, or in wilderness-quarters, where they will grow, and make a good appearance at a season when there are but few plants in beauty.

White HELLEBORE, Veratrum, a genus of plants ranged by Linnæus among the *polygamia monoecia*, and of which there are four species. 1. White Hellebore with a decomposed spike, and erect petals. 2. White Hellebore with a compound spike, and very spreading petals, or dark-flowered White Hellebore. 3. White Hellebore with a single spike, and leaves sitting close to the stalk. 4. White Hellebore with a single spike of flowers, spreading petals, and longer stamina.

The first species grows naturally on the mountains in Austria, Helvetia, and Greece. The root is perennial, composed of many thick fibres gathered into a head. The leaves are ten inches long, and five broad in the

middle, rounded at the points, having many longitudinal ribs. The stalks rise three or four feet high, and branch out on every side almost their whole length; under each of these branches is placed a narrow plaited leaf, which diminishes in its size as it is nearer the top of the stalk. The branches and principal stalk are terminated by spikes of flowers set very close together, which are composed of six green erect petals; in their centre are situated three obtuse germen. From the point of these rise six stamina, which spread asunder, terminated by four-cornered summits. These are succeeded by oblong compressed capsules with one cell, filled with membranaceous seeds.

The root of the second species is composed of numerous, thick, long fibres, connected to a small head. The stalk is round, upright, firm, and near a yard high; naturally of a pale green, but often stained with a deep purple toward the ground. The leaves are placed alternately, and they have no footstalks, but surround the stem at their bases. They are very large, long, of considerable breadth, and marked with strong and high ribs, all running lengthways; the surface of the leaf is rendered very uneven by these, and the aspect is singular. The colour is of a pale green, often inclining toward yellowish, and the substance firm and harsh. The flowers crown the stalk in a vast cluster, reaching a third part of its length; they are arranged on long common footstalks, with short hairy ones for every flower, and their colour is an extreme dark reddish purple. Singly they are not large, but the vast number of them renders the plant conspicuous; many hundreds being often open at a time. Each flower is composed of six petals, and is placed naked upon the footstalk without a cup.

The third species is a native of North-America. The root is tuberous. The leaves are oblong, having several longitudinal furrows, and spreading themselves on the ground. Between these come out a single stalk which rises near a foot high, having a few very small leaves or sheaths, placed alternately; and at the top the flowers are produced in a single, thick, close spike; they are small and of a yellowish white colour; but are rarely succeeded by seeds in England.

The fourth sort grows naturally at Philadelphia. The root is composed of thick fleshy fibres. The leaves are oblong, oval, of a light green colour, having six longitudinal veins, they are rounded at the points, and continue the year. In the centre of the leaves springs up a single erect stalk a foot high, having a few vestiges, or small leaves, standing alternately close to the stalk, which end in acute points. The stalk is crowned by a thick obtuse spike of dark red flowers, whose petals spread open flat. This plant flowers the latter end of June, and in warm seasons the seeds will ripen here.

Culture of the White HELLEBORE.

All these species may be propagated either by seeds or parting the roots: the latter is the most ready way, and succeeds very well; but the other is the only method by which fine plants can be obtained.

The season for parting the roots is either in spring or autumn, but the former is the most preferable season, as the plants are sure to succeed best.

The soil should be a mixture of fresh pasture earth, and rich garden mould in equal quantities; a bed should be made of this, and dug two spades deep, and perfectly levelled, it should be in a part of the garden open to the morning sun, and not shaded by trees. The roots must be planted at eighteen inches distance, and watered and weeded in the common way. Every autumn and spring the surface of the mould must be well broke between the plants; and every third year, when they should be taken up for parting, the whole soil must be dug out, and fresh put in its place; or the plants must be set in another border.

The seeds should either be saved from the stoutest plants here, or procured from the places where they grow naturally. These should be sown in autumn; and the following spring, they must be often watered, and the bed kept clean from weeds; and where they have risen

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risen too close they must be thinned. The succeeding spring they must be planted out at six inches distance in another bed; and the spring succeeding that, into the garden, where they will flower, according to the various accidents of their growth, that or the succeeding summer.

Bastard HELLEBORE, *Serapias*, a genus of plants of which there are many species, growing naturally in England and Ireland; but they are seldom kept in gardens, being difficult to propagate.

Culture of the Bastard HELLEBORE.

These plants may be taken up from the places where they grow naturally, when their leaves begin to decay, and planted in a shady, moist place, where they will thrive and flower.

HELMET-FLOWER, or **SKULL-CAP**, *Scutellaria*, a genus of plants, of which there are six species. 1. Helmet-flower, with almost heart-shaped, sawed leaves, and interrupted spikes of flowers. 2. Helmet-flower, with obtuse, heart-shaped leaves, which are bluntly sawed, and leafy spikes of flowers. 3. Helmet-flower, with oblong, acute-pointed, heart-shaped, sawed leaves, and almost naked spikes of flowers. 4. Helmet-flower, with cut leaves, which are woolly on their under side. 5. Helmet-flower, with oval leaves sitting close to the stalks, the under of which are sometimes sawed, and the upper entire. 6. Helmet-flower, with sawed, cut leaves, which are smooth on both sides, and a roundish, four-cornered spike of flowers.

The first of these species grows naturally in Italy. It has a perennial root, and the stalk is four-cornered, hairy, and rises two feet high. The leaves are heart-shaped, sawed on their edges, and placed opposite. The flowers grow in interrupted spikes at the tops of the stalks. In some the colour is purple, and in others white.

The second species is a native of Crete. This rises with a ligneous stalk about two feet high, sending out slender side branches. The leaves are obtuse, heart-shaped, bluntly sawed on their edges, hoary on their under side, and of a bright green on their upper. The flowers are situated on the tops of the stalks, in long spikes; they are white, and have small leaves growing between them.

The third species is a native of the Levant. The root is perennial. The stalks rise from three to four feet high, sending out a few slender branches from their sides. The leaves are oblong, heart-shaped, ending in acute points, and sawed on their edges. The flowers are disposed in naked spikes, at the tops of the stalks; their colour is purple, and they have longer tubes than any of the other sorts.

The fourth species, which is also a native of the Levant, is a perennial plant, with shrubby stalks, which spread on the ground. The leaves are almost triangular, placed opposite, of a light green on their upper side, and downy on their under, standing upon slender foot-stalks. The flowers are situated at the ends of the branches, in short spikes; they are of a bright yellow, and are succeeded by grey seeds, which ripen in the empalement.

The fifth sort grows naturally in North America. It has a perennial root, from which arise several four-cornered stalks, two feet high, sending forth side-branches. The lower leaves are heart-shaped, sawed on their edges, and standing upon long foot-stalks. The upper leaves are oval and entire. The flowers are blue, and situated in long loose spikes, at the ends of the branches; these are succeeded by seeds, which ripen in the empalement.

The sixth species grows naturally on the Alps and Appennines. The stalks are shrubby, and trail on the ground. The leaves are smooth, and cut on their edges. The flowers crown the stalks in roundish, four-cornered spikes; in one they are white, and in another variety blue; they are larger than the flowers of any other known species, and make an agreeable variety in gardens.

Culture of the HELMET-FLOWER.

These plants are all propagated by seeds, which if sown in autumn, soon after they are ripe, they will

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more certainly succeed, than when they are sown in the spring.

The seeds may either be sown where the plants are to remain, or in a border, to be afterwards removed; but as the fourth species does not bear transplanting well, unless they are removed young, the seeds of that had better be sown where the plants are to stand; this should be on a dry, warm border of poor earth, where the plants will live much longer, and make a better appearance than on a rich soil. When the plants come up, they will require no other care but to thin them, and keep them clean from weeds.

When the other sorts come up, and are fit to remove, they may be transplanted into a nursery bed, at five or six inches distance, where they may stand till autumn, but must be kept clean from weeds; then they may be transplanted into the borders of the flower-garden, where they are to remain.

As these plants are not of long duration, it will be proper to sow a succession of seeds every other year, at least, to supply the places of those which decay.

HEMLOCK, *Cicuta*, a genus of plants, of which there are only two species. 1. Hemlock, with umbels opposite to the leaves, and obtuse, margined foot-stalks; or Water Hemlock. 2. Hemlock, with pointed serratures to the leaves, and membranaceous foot-stalks, ending in two lobes.

The first species grows naturally in standing waters, in most parts of England, and is never cultivated in gardens. The second species is a native of North America.

Culture of the HEMLOCK.

The second species is propagated by seeds, which should be sown in autumn, in a shady border; the plants will come up in the spring, and require no other care than to be kept clean.

HENBANE, *Hyoscyamus*, a genus of plants, ranged by Linnæus among the *pentandria monogynia*, and of which there are five species. 1. Henbane, with leaves embracing the stalks; or the common Henbane. 2. Henbane, with leaves upon foot-stalks, and sessile flowers. 3. Henbane, with leaves upon foot-stalks, and flowers upon foot-stalks, terminating the branches. 4. Henbane, with spear-shaped leaves, somewhat indented, and a prickly cup. 5. Henbane, with oval, entire leaves, and swollen globular cups.

The first species grows commonly upon the sides of banks and dunghills, in this country.

The second is a native of the south parts of Europe.

The third grows naturally in the islands of the Archipelago.

The fourth is a native of Persia, and the fifth of Siberia.

Culture of the HENBANE.

The four first species are all biennials, and perish soon after they have perfected their seeds, which if permitted to scatter, will produce plenty of the plants the spring following; or, if the seeds are sown at that season, they will succeed much better than in the spring. As these seldom come up the first year, they require no other culture, but to be kept clear from weeds, and thinned where they grow too close.

The fifth species is a perennial plant, and may be propagated either by sowing the seeds soon after they are ripe, or by cuttings, planted in any of the summer months.

Good HENRY. See the article *GOOSE-FOOT*.

HEPATICA, or **NOBLE LIVERWORT**, a genus of plants, ranged by Linnæus among the *polyandria polygynia*, and of which there are five species. 1. The single Blue Hepatica, or Noble Liverwort. 2. The double Blue Hepatica, or Noble Liverwort. 3. The single White Hepatica, or Noble Liverwort. 4. Single Red Hepatica, or Noble Liverwort. 5. Double Red, or Peach-coloured Hepatica.

These plants are some of the greatest beauties of the spring; their flowers are produced in February and March in great plenty, before the green leaves appear, and make a very beautiful figure in the borders of the pleasure-

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pleasure-garden, especially the double sorts, which commonly continue a fortnight longer in flower than the single, and the flowers are more beautiful; and the most elegant among them is the second species, the culture of which is proper for all the rest.

Double Blue HEPATICA. The root is large, and when it has stood some time, divides into many heads. It is covered in every part with innumerable fibres, moderately thick, and of a reddish black, variously entangled with one another.

The first production is the flowers; these rise two or more, from every head of the root; so that from a plant of considerable standing, it is not unusual to see forty, fifty, or more in a cluster, all rising from one principal root. These stand singly upon slender and weak foot-stalks, four inches in height, of a pale green, usually tinged more or less with red. The flower which crowns each stalk is large, and of a fine sky-blue, crowded with oblong, undulated petals; and in the midst decorated with a small tuft of buttons, placed upon numerous filaments. The seeds follow, in the single flowers, naked, and clustered together in an oval head; some also are ripened after the semi-double flowers; but from the perfect double rarely any.

Culture of the Double Blue HEPATICA.

Little care appears necessary in the culture of a plant, which stands all seasons, and grows in any soil; but by pursuing the following directions, the gardener will have flowers of twice the common bigness, and of a much superior colour. These are to be obtained by sowing seeds of the best kinds: for which purpose he should mark the largest and finest of his single, and some of his double flowers, and when they are almost ripe let him observe the leaves; those heads which follow semi-double flowers, and are accompanied with the deepest purple leaves, are the finest; let him cut off these in the head, and lay them on a papered shelf. When they begin to fall, he must separate them entirely, and spread them out again for eight or ten days longer, and then tie them up in bags.

In the beginning of August, dig up a border in a part of the garden, open to the morning sun, but sheltered from the full blaze of noon. Take out half the mould that you dig up, and mix with the rest as much fresh earth from under the turf, in a rich upland pasture; break this very well together, rake the surface level, scatter on the seeds, and sift over them a quarter of an inch of the same mould.

In spring the young plants will appear, and the weeds which rise with them must be carefully taken up by hand; give them a gentle watering twice a week in dry weather, and from time to time clear away the weeds. In the beginning of August mark the best plants, and thin them to about eight inches distance. Let the weaker ones, which are taken up, be planted in other parts of the garden, but never remove the others out of their place.

The next spring some of them will flower, and the succeeding season all the remainder. In their first bloom they will be very elegant, but it will be two years more before they arrive at their full perfection. From this time there will every year, be more and more numerous flowers from each root.

All the care they require, is to be kept clear from weeds, to have the surface of the mould stirred about them often, and every autumn to have half an inch of fresh pasture mould sifted over them, taking away the old surface; this must be done with great care, not to wound the roots.

HERB *Bennet*, *Geum*. See the article *GEUM*.

HERB *Christopher*. See *BANEBERRIES*.

Willow HERB. See *WILLOW Herb*.

HERBACEOUS, grassy, or after the manner of grass.

HERMANNIA, a genus of plants, for which we have no English name, ranged by Linnæus among the *monadelphia pentandria*, and he enumerates seven species of it. 1. *Hermannia*, with oval, folded, crenated, woolly leaves. 2. *Hermannia*, with oval leaves, acutely

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cut, and foot-stalks with two flowers. 3. *Hermannia*, with wedge-shaped, folded leaves, crenated and indented. 4. *Hermannia*, with obtuse, spear-shaped, sawed leaves. 5. *Hermannia*, with obtuse, spear-shaped, entire leaves. 6. *Hermannia*, with trifoliate, sessile leaves. 7. *Hermannia*, with narrow leaves, ending in many points.

All these species are shrubby plants. The first rises about three feet high; the root is divided, white, and hung with fibres. The stem is brown. The branches, which spread variously, are whitish, tender, and covered with a soft down. The leaves stand upon these, in wild irregularity; they are oblong, deeply sinuated along the edges, and of a whitish green, covered thick with a soft downy matter, which makes them feel like velvet. The flowers are very numerous, and of a singular aspect: they grow at the tops of the branches, and on foot-stalks, from the bosoms of the leaves, two or three on each. They are very large, hang drooping, and are twisted: their colour is a delicate pale yellow; they rise from a downy cup, and at the base of their foot-stalks are placed regularly, three oblong, narrow, undivided leaves. The cup is formed of a single piece, swelled at the base, and divided at the rim into five segments. The flower itself is formed of five oblong petals: these spread at the mouth, and turn toward the sun; and at the base they grow very small, and have on each a membrane, running sideways, which together form a nectiferous tube. In this flower stand five filaments, which lightly cohere at the base, and among these rises a style, which exceeds them in length. The seed-vessel is roundish, but has five ridges. The seeds are numerous and small.

The second species does not rise so high as the first. It sends out a great number of branches; and the leaves, which are smaller than those of the former, are rough, and sit close to the branches. The flowers grow in short close spikes, at the end of every shoot, so that the whole shrub seems covered with flowers. They are of a bright yellow, and appear toward the end of April.

The third species rises with a shrubby stalk, six or seven feet high, dividing into many irregular branches, covered with a brown bark. The leaves are wedge-shaped, narrow at their base, but broad and round at their top. The flowers grow in short spikes, on the upper part of the branches; they are small, and of a deep yellow. These appear in April and May.

The fourth species rises with a shrubby, upright stalk, seven or eight feet high, sending out many ligneous branches from the side. The leaves are obtuse, spear-shaped, and sawed on their edges toward the end. The flowers are situated on the sides of the stalks, in small bunches; they are of a delicate straw-colour, and appear in May and June.

The fifth species has shrubby, branching stalks, which are very bushy, but seldom rise more than a foot and a half high. The branches are very slender. The leaves are hairy, and of different sizes; they are entire, of a pale green, and sit close to the branches. The flowers are placed singly on the sides of the stalks; they are small, and of a deep yellow colour.

The sixth species seldom rises more than two feet high. The stalk is soft and ligneous, sending out slender irregular branches. The leaves are trifoliate, and stand upon pretty long foot-stalks. The flowers grow in loose spikes, at the ends of the branches; at their first appearance they are of a bright gold colour, but in two or three days they become paler.

The seventh species rises with a shrubby stalk, near three feet high, sending out many slender branches, covered with a reddish bark. The leaves are narrow and wing-pointed. The flowers adorn the sides of the branches in small clusters; they are of a deep yellow.

Culture of the HERMANNIA.

All these species are natives of the country about the Cape of Good Hope, and are propagated by cuttings, which may be planted during any of the summer months, in a bed of fresh earth, observing to water and shade them till they have taken root.

In about six weeks after planting, they must be taken up, with a ball of earth to their roots, and planted in pots,

pots, filled with light fresh earth, placing them in a shady situation till they have taken new root; after which they may be exposed to the open air till some time in October, when they must be removed into the greenhouse, and have as much free air as possible: they require frequent waterings, and must be new potted twice a year, in May and September.

The plants may likewise be raised from seeds, which should be sown upon a moderate hot-bed; when the plants come up, they should be transplanted into small pots, and plunged into another moderate hot-bed, in order to promote their rooting; after which they must, by degrees, be inured to the open air, and may then be treated as the old plants; but they seldom produce good seeds in this country.

HERMODACTYLE, a species of Iris. See the article Iris.

HERNANDIA, a genus of plants, known in the West-Indies by the name of Jack-in-a-Box, and of which there is but one species.

It is very common in Jamaica, Barbadoes, St. Christophers, and many other islands of the West-Indies. The fruit, when ripe, is perforated, and the nut in the inside becomes hard; so that when the wind blows through the fruit, it makes a whistling noise, which may be heard at a distance. In Europe this plant is preserved in the gardens of the curious.

Culture of the HERNANDIA.

It is propagated by sowing the seeds on a hot-bed in the spring: and when the plants are two inches high, they should be transplanted each into a separate pot, and plunged into the hot-bed again, where they must be watered and shaded till they have taken root, after which the air must be admitted to them in proportion to the warmth of the season and the heat of the bed they are placed in.

As the plants advance, they should be removed into larger pots, in doing of which, care should be taken not to injure their roots, and also to preserve a good ball of earth to them. They must be shaded from the sun till they have taken fresh root. The best time for doing this, is in July, that they may be well rooted before the cold weather. They must be constantly kept in the bark-stove; in winter they should have a moderate share of heat, and plenty of air, in very hot weather.

HIBISCUS, *Syrian Mallow*, a genus of plants, ranged by Linnæus among the *monadelphia polyandria*, and of which he enumerates twenty species; of these the following eleven are cultivated in gardens. 1. Hibiscus, with leaves divided in a foot-like manner, into five parts, and with the inner cups bursting sideways; or Fig-leaved Hibiscus. 2. Hibiscus, with heart-shaped leaves, five angles bluntly sawed, and a tree-like stalk, commonly called China Rose. 3. Hibiscus, with heart-shaped, target leaves, seven sawed angles, and prickly hairs, commonly called Musk. 4. Hibiscus, with smooth, sharp-pointed, oval, and serrated leaves; or oval-leaved Rose Hibiscus. 5. Hibiscus, with oval, spear-shaped leaves, with the upper parts cut and sawed, and a tree-like stalk, being the Syrian Retinia, commonly called *Althæa frutex*. 6. Hibiscus, with entire, heart-shaped leaves. 7. Hibiscus, with sawed leaves, the lower oval and undivided, the upper divided into three parts, with a prickly stalk. 8. Hibiscus, with hand-shaped, five-pointed leaves, and a prickly stalk. 9. Hibiscus, with the lower leaves heart-shaped and angular, the upper ones somewhat spear-shaped, nodding flowers, and a recurved pistil. 10. Hibiscus, with oval-pointed, sawed leaves, a single stalk, and foot-stalks having flowers. 11. Hibiscus, with trifoliate, cut leaves, and swollen cups, called Venice Mallow, or Flower-of-an-Hour.

The first species rises to the height of four feet, robust, branched, and spreading; its leaves are large, and, in the highest degree, elegant. The root is fibrous; the branches are round and yellowish, and often purple at the joints. The leaves are numerous, and of a delicate green; those near the bottom are divided, in the manner of a fig-leaf, into five principal parts; these toward the

top have only three divisions, and sometimes scarce any. The flowers are numerous and large; their ground colour is a very pale, but beautiful yellow, and they have streaks of purple. These flowers are scattered at distances along the upper branches, and each is surrounded at the bottom by a double cup. The petals are five; they are very large, expanded, and lightly folded toward the edge; of the two cups, the outer one is composed of eight narrow leaves, and remains with the fruit: the inner one is formed of a single leaf, divided into five parts at the rim, and it remains with the other. The seed-vessel is large, pyramidal, and furrowed upwards. In the center of this flower stands an obvious arrangement of antheræ, or button; the thread of these do not rise singly, as in many flowers, but are united in a body, and form a kind of tube; from this grow the several antheræ, which stand separate and clear.

The second species is a large shrub, and with proper care will spread its branches in great regularity, or rise in a single stem, as a tree. The leaves are broad and deeply divided, sometimes into three, but more usually into five parts, which are pointed and serrated. Their colour is a lively green, and they are rough to the touch. The flowers are very numerous, and of the bigness of the double Piony, which they equal also in the multiplicity of leaves or petals. They give a vast glow by size and number; and their variety of colours charms the eye yet more. They have distinctly three appearances. As they just open from the bud, they are of a milky white; when half blown, they are tinged with a fleshy red; and when at their full perfection, they are of a deep purple. Their petals stand in three or more series, and they are curled and crumpled, so as to reflect the light in a variety of shades and tincts. The eye may look with wonder upon one of them many hours together.

The third species is three feet high; the root is fibrous and spreading. The stalk is round, upright, and branched with a beautiful regularity. The leaves are very beautiful and large; they stand on long foot-stalks, which are inserted underneath in the main body of the leaf; they are broad, and beautifully angulated; those in the lower part of the flower have seven corners; about the middle of the stalk each leaf has five; and at the top they have only three. The surface of the leaf is rough; its colour is a fine green, and its veins are purple. The flowers are numerous and very large; they are disposed at distances upon the stalks. From near the bottom to the top, they are vastly large, and of a pale, but very lively yellow, stained in the center with a bloody circle; each is composed of five large petals, and placed in a double cup. When these are fallen, there appears a large brown seed-vessel, in which are numerous sweet-scented seeds.

The fourth species rises to six or eight feet in height a spreading shrub. The root is fibrous; the trunk is covered with a brown rough bark; the younger shoots are grey and smooth, and their inner bark is green. The leaves are numerous, and of a handsome shape; they have long foot-stalks, and their colour is a pale, but elegant green; they are grossly serrated at the edges, and soft to the touch. The flowers are very large and beautiful; they terminate the branches, and their colour is a fine strong red; they are naturally double, and the numerous petals which compose them, are curled and waved at the tops and edges. Each flower has a double cup: the outer whitish, and the inner green; the filaments being connected in the lower part, so as to form a kind of Cylinder, and their buttons numerous; these are yellow, and the divisions of the style are crimson. This shrub is a native of the East-Indies, and is one of the finest and most valued of their productions. The flowers are no less conspicuous for their number than their size and colour, and they there cover the branches throughout all the year. With us it must not be expected to attain this degree of perfection; but we may raise it to so much excellence, as to eclipse most of our stove-plants.

The fifth species is commonly called *Althæa Frutex* by those who propagate the shrubs for sale. Of this there are four or five varieties: the most common has pale purple flowers with dark bottoms, a second has bright purple flowers with black bottoms, a third has white flowers with purple bottoms, and a fourth variegated flowers with dark bottoms; there are also two with variegated leaves, which are by some much esteemed.

These shrubs grow naturally in Syria, and are beautiful ornaments to a garden in the autumn. They rise with shrubby stalks to the height of eight or ten feet. The branches are woody, and covered with a grey bark. The leaves are oval, spear-shaped, and the upper parts are frequently divided into three lobes. The flowers are situated at the wings of the stalks; they are large and composed of five roundish petals, which join at the base but spread open at the top, in shape of a bell; these appear in August and if the season is not too warm, there will be a succession of flowers part of September; they are succeeded by short capsules with five cells, filled with kidney-shaped seeds.

The sixth species grows naturally in both Indies; and rises with a woody stem eight or ten feet high, dividing into several branches toward the top, which are covered with a woolly down. The leaves are round, heart-shaped, and ending in acute points; they are of a lucid green on their upper side, and hoary on their under, full of large veins and are placed alternately on the stalks. The flowers grow at the ends of the bunches in loose spikes, they are of a whitish yellow, and are succeeded by short acuminate capsules, opening in five cells, filled with large kidney-shaped seeds.

The seventh species rises with an upright stalk seven or eight feet high. The lower leaves are oval, serrated, and entire, but the upper leaves are divided almost to the footstalk into five spear-shaped segments, like the fingers of a hand, standing on very long footstalks, having thorns at their base. The flowers are situated at the wings of the stalks; they are large, of a pale sulphur colour, with a purple bottom, and are succeeded by oval, acuminate, prickly capsules, which open in five cells filled with large kidney-shaped seeds.

The eighth species is a native of Ceylon. It rises with a prickly herbaceous stalk from two to three feet high, dividing upward into small branches. The leaves are hand-shaped, and divided into five parts. The flowers are placed at the wings of the leaves; they are small, white, with purple at the bottom, and are succeeded by short obtuse capsules with five cells filled with kidney-shaped seeds.

The ninth species grows naturally about Venice. It rises three, and sometimes four feet high. The lower leaves are angular and heart-shaped, but the upper are spear-shaped and slightly indented on their edges. The flowers are situated at the wings of the leaves upon long footstalks, they are of a purple colour with a dark bottom, and are succeeded by five-cornered capsules, filled with kidney-shaped seeds.

The tenth species is a native of North America. The stalk is herbaceous and never branches. The leaves are oval, with three lobes, which are not deeply divided; they are of a bright green on their upper side, but of an ash colour on their under. The flowers are situated at the wings of the stalks; they are large and of a bright purple.

The eleventh species is a native of the Cape of Good Hope. It has strong, hairy, branching stalks. The leaves are broad, the lower being divided into three and the upper into five obtuse lobes, which are crenated on their edges. The flowers are large and of a pale purple.

Culture of the HIBISCUS.

The first species is propagated by seeds which must be sown on a moderate hot-bed the latter end of March. When the plants have three or four leaves, let them be removed to another hot-bed: this will forward them greatly against the first months of summer. When the weather is settled warm, and cold nights are no longer feared, let them be removed in a showery day, into a warm and well sheltered border, where there is depth of good

earth, well broke by tillage, and improved by rotten dung.

Here let them be shaded and gently watered till they have taken root; after which they must be kept clear of weeds, the ground about them often broke with a hoe, and their stems tied up to short firm stakes. They must be then well watered, and brought forward as much as possible: by this repeated care, one plant will produce at a time fifty flowers, and they will be tinged more or less with purple; often they will have a fleshy red throughout.

The second and fourth species are propagated by seeds, which in spring should be sown in pots of the following compost. Mix equal quantities of rotted wood, from the bottom of an old stack, and of fine garden mould; break these thoroughly, and sift them. Then fill the pots with this within two inches of the rim. Lay in about twenty seeds upon the surface of the mould in each pot, and sift more over them, till they are covered an inch, plunge them into a moderate hot-bed: thin the plants when they rise, leaving only the two best in each pot. They must not be quite exposed to the open air the first season, and they will require the warmth of a moderate stove, but as they get more strength, they may be placed among the green-house plants. They usually flower in November.

The seeds of the third species must be sown the beginning of March, on a moderate hot-bed covered well with fine mould; and when the plants are about two inches high, they must be removed into another, where they are to stand at five inches distance. They must be watered lightly and shaded carefully till they have taken root; and then there must be as much air admitted as the season will allow.

When they are grown to such a height that they can no longer be contained in the frame, they must be carefully planted out into pots, and watered and shaded till they have taken root. They must after this be allowed as much free air as they can bear, and they will flower in great perfection.

The fifth species is also propagated by seeds which should be sown in pots filled with light earth, about the end of March, and if the pots are plunged into a gentle heat, it will greatly forward the growth of the seeds. When the plants come up they must be inured to the open air, and in May the pots may be plunged into the ground, in a border exposed to the east, where they may have the morning sun, must they be kept clean from weeds, and in the summer season, in very dry weather, gently refreshed with water.

In autumn it will be proper to remove the pots under a common frame; or where there is not such a convenience, they may be plunged close to a hedge, pale, or wall, to a good aspect; and in severe frost they should be covered with mats, straw, or other light covering. About the end of March let them be transplanted into a spot of light ground, divided into beds four or five feet broad, with paths two feet broad between them. Take the plants carefully out of the pots, with a ball of earth to their roots, and set them in these beds at nine inches distance; close the ground gently about their roots, and let a little old tanners bark, or mulch be laid over the surface.

During the summer they must be kept clean from weeds, and in the autumn following be covered, especially if they shoot late in the season.

In these beds the plants may stand two years, by which time they will be fit to transplant where they are designed to remain: the best season for doing which is about the end of March.

These plants may also be propagated by cuttings, which if planted about the end of March, in pots filled with light earth, and plunged into a gentle heat, will take root. The several varieties of this species may be propagated by grafting upon each other.

The seeds of the sixth, seventh and eighth species should be sown in the spring on a good hot-bed, and when the plants come up they should be removed into pots, and plunged into a fresh hot-bed, treating them afterwards in the same way as the *Amaranthus*.

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The ninth species is also propagated by seeds, which must be sown in the spring on a moderate hot-bed, and when the plants are fit to remove, they should be each planted in a separate pot, and plunged into a hot-bed, treating them in the same way as the other tender sorts, and allowing them a great share of air in warm weather.

The stalks decay in the autumn, but if the pots are sheltered from frost under a hot-bed frame, they will continue several years, and put out new stalks in the spring.

The seeds of the tenth and eleventh species should be sown where the plants are designed to remain. These require no other culture but to be kept clean from weeds and thinned where they grow too close. If the seeds are permitted to scatter when ripe, the plants will come up full as well as when sown.

HIG-TAPER, a species of Mullein. See the article **MULLEIN**.

HIPPOCRATEA, a genus of plants for which we have no English name, and only one species.

It is a native of South America, and grows with a slender twining stalk to the height of ten or twelve feet.

Culture of the HIPPOCRATEA.

The seeds of this plant must be procured from Campeachy, or other places where it grows naturally, and sown in pots filled with light fresh earth, and plunged into the bark-bed in the stove, where they must constantly remain. When the plants come up they should have very little water, as much wet would rot the roots; and in all respects treated as other tender stove-plants.

HIPPOMANE, *Manchineel*, a genus of plants of which there are three species. 1. Hippomane with oval sawed leaves. 2. Hippomane with oval oblong leaves which are sawed, and have glands at their base. 3. Hippomane with oval leaves which have prickly indentures.

The first species is a native of the West Indies. It is a very large tree, almost equalling the Oak in size, with a brownish bark. The trunk divides upwards into many branches. The leaves are oblong, ending in acute points, slightly sawed on their edges, of a lucid green, and stand upon short foot-stalks. The flowers are situated in short spikes at the ends of the branches, which having no petals make but little appearance. These are succeeded by fruit about the size and of the same shape as the Golden Pippin, turning of a yellow colour when ripe, which has often tempted strangers to eat of them to their cost, for being of a poisonous quality, unless timely remedies are applied, they often prove fatal.

The second species is a native of Carthage in New Spain, where it grows as large as the first, only the leaves of this are much longer, and have two small glandules growing at their base; they are sawed on their edges, and are of a lucid green.

The third species grows naturally at Campeachy, it is of much humbler growth than either of the former, seldom rising more than twenty feet high; the leaves of this greatly resemble those of the common Holly, and are set with sharp prickles at the end of each indenture; they are of a lucid green and continue all the year.

Culture of the HIPPOMANE.

These plants can never be expected to rise to any great height in England, being too tender to live in our climate out of the stove.

They are easily raised from good seeds, which must be sown upon a hot-bed, and when the plants come up, they should be each planted in a separate small pot, and plunged into a good bed of tanners bark, treating them in the same way as other tender plants; but they must not have much wet, for they abound with an acrid milky juice, and such plants are soon killed by much moisture. In autumn they must be removed into the stove, and plunged into the tan-bed, where they should constantly remain. In very hot weather they should have a large share of air admitted to them, and gently refreshed with water.

H O G

HOE, a tool made like a cooper's addz, to cut upwards in gardens, fields, &c. This tool is commonly called the hand-hoe; for other sorts of Hoes, see the next article. This instrument is of great use, and should be more employed in hacking and clearing the several corners, cracks, and patches of land, in spare times of the year, which would be of no small advantage thereto.

HOEING, according to Tull, is the breaking and dividing the soil by tillage, whilst the corn, and other plants, are growing thereon. It differs from common tillage, which is always performed before the corn or plants are sown or planted, in the time of performing it; and it is much more beneficial to the crops than any other tillage. This sort of tillage is performed various ways, and by means of different instruments.

Land, which, before tilling, would have yielded little, though the more it is tilled before sowing, the greater plenty of crop it yields; yet, if tilled only before the sowing, will always have some weeds, and they will partake of the advantage of the tillage, as well as the corn; this is one reason for an after tillage, such as that by Hoeing. But there is another: that is, that as soon as the ploughman has done his business by plowing, the soil of its own accord, begins to undo it all again, by tending towards its original texture, and specific gravity, the altering of which was the only business of all the former tillage. The breaking the particles of the earth, and making in it new pores, and new superficies, is the great business of the plough and harrow; but as soon as their use is over, the earth begins to coalesce again to its own form: the particles unite together, and the artificial pores in a great measure close up. The seed is nourished in a worse ground than it was at first put into, and the more the plant grows up and requires a larger supply of food, the worse the pasture becomes; while nourishment is thus denied the growing plants, they are at the same time choaked with weeds, which being of a hardier nature than they, will grow with less supplies, and therefore thrive more vigorously, and rob them of a great part of the little food the land before allowed them. Transplanting is nearly allied to Hoeing, but it is much inferior; the nature of this will not admit of its being a general thing, and if it would, Hoeing is better; for by transplanting, the plants can only be kept up to a certain period, after which they will not bear it; but Hoeing may be used to them with advantage, to their utmost standing, and makes them vigorous all the while. The roots of a plant are necessarily broken off in transplanting, and it requires some time for it to strike a whole set of new ones; and if the earth about it is not kept thoroughly moistened all this time, the new formed roots will not be able to shoot, and the plant will starve in the midst of plenty; but on the contrary, in Hoeing, the same advantage of a new pasture for the plant is obtained, by breaking the particles of earth, and at the same time no more of the roots are broken off, than can easily be supplied, and the rest remaining in their places, the plant continues growing without that stop and decay, which must happen on transplanting, and which it recovers only by degrees.

One great benefit of hoeing, is, that it keeps plants moist in dry weather, the advantage of which to their growth, is easily seen. This good office it performs; for being better nourished by hoeing, they require less moisture, and consequently carry off less; for these plants, which receive the greatest increase, having most terrestrial nourishment, carry off the least water in proportion to their augment, as is proved by Dr. Woodward's experiments. Secondly, the hoe, particularly the horse-hoe, for the other does not go deep enough, procures moisture for the roots, from the dew which falls most in dry weather; and these dews seem to be the most enriching of all moisture, as it contains in it a fine black earth, which will subside from it in standing, and which seems fine enough to be the proper pabulum, or food for plants.

HOGS-FENNEL, or **SULPHUR-WORT**, *Pencadunum*, a genus of plants, of which there are four species.

ties. 1. Hogs-fennel, with leaves, which are divided by threes, and these again divided into three linear parts. 2. Hogs-fennel, with leaves cut into three parts, which are long, slender, and have irregular umbels; or greater Italian Hogs-fennel. 3. Hogs-fennel, with five leaves, divided by threes, which are very slender and short, and a very large umbel. 4. Hogs-fennel, with very narrow, hair-like leaves, divided by threes, a very branching, spreading stalk, and irregular umbels.

The first species grows naturally in marshy meadows, in several parts of Germany, and is supposed to do the same in England. It has a perennial root, from which the foot-stalks of the leaves rise, which are channelled; they are naked at the bottom, but about four or five inches from the root, branch into three smaller foot-stalks, and these again divide into three, and each of these divisions sustain three narrow leaves, which when bruised, emit a strong scent, like sulphur. The stalks rise near two feet high; these are channelled, and divided into two or three branches, each being terminated by a large regular umbel of yellow flowers, composed of several small umbels, which are circular.

The second species is a native of Italy. The root is perennial. The foot-stalks of the leaves are large and furrowed, dividing into three smaller branches, which are again divided into three, and these end with three long narrow lobes, or small leaves, which are much longer than those of the other sort. The stalks, which sustain the umbels, rise near three feet high, and divide toward the top into several small branches, each supporting an umbel, composed of several smaller rays, or umbels, which stand upon very long foot-stalks. The flowers of this are yellow, and shaped like those of the former, but are much larger.

The third species grows naturally in many parts of France. It has a strong perennial root, from which come out leaves, which branch into three divisions, and these divide again into three smaller; each of these divisions are decorated with five short narrow leaves. The stalks are strong, round, and not so deeply channelled as either of the former, sustaining a very large umbel of yellow flowers, shaped like those of the former sorts.

The fourth species grows naturally on St. Vincent's rock, near Bristol; it is a biennial plant: the leaves are short and very narrow, spreading near the surface of the ground. The stalks rise near a foot high, and are branched almost from the bottom; these branches are nearly horizontal, having a few short narrow leaves on them, of a lucid green; each stalk is crowned with a small umbel of flowers, which are of an herbaceous yellow colour, and small.

Culture of the HOGS-FENNEL.

These species are all propagated by seeds, which should be sown in the autumn, soon after they are ripe; for those which are sown in the spring seldom succeed: or if the plants come up, it is rarely before the following spring.

When the plants come up, they must be kept clean from weeds, and the autumn following they may be transplanted where they are to remain; they love a moist soil and a shady situation, but will not thrive under the drip of trees.

The roots of the three first species will continue several years, and every year produce flowers and seeds, but the fourth sort seldom ripens seeds in a garden, they must therefore be procured from the places where it grows naturally.

HOGWEED, *Boerhavia*, a genus of plants, of which there are four species. 1. Hogweed with an erect stalk. 2. Hogweed with a diffused stalk. 3. Hogweed with a climbing stalk. 4. Hogweed with oval leaves, flowers coming from the wings of the leaves in close heads, and a hairy trailing stalk.

The first species rises with an upright smooth stalk, two feet high; at each joint it has two oval pointed leaves growing opposite, upon foot-stalks an inch long at the joints, which are far asunder, come out small side branches, growing erect; these, as also the foot-

stalks, are terminated by loose panicles of flesh-coloured flowers, which are succeeded by oblong glutinous seeds.

The second, third, and fourth species are natives of Jamaica. The second sends out many diffused stalks, a foot and a half long. The leaves are small and round. The flowers are situated at the wings of the leaves, and the ends of the branches, upon long branching foot-stalks. They are of a pale red colour, and are succeeded by seeds like the former.

The third sort sends out several stalks from the root, which divide into many branches, and rise to the height of five or six feet. The leaves are heart-shaped, and grow by pairs opposite at each joint, upon long foot-stalks. The flowers are placed in loose umbels at the extremity of the branches. They are yellow, and are succeeded by small, oblong, viscous seeds.

The fourth sort sends out many trailing hairy stalks, which divide into smaller branches, which are decorated with oval leaves at every joint; and at the wings of the leaves are situated naked foot-stalks, sustaining a small close head of scarlet flowers, which are very fugaceous, seldom standing more than half a day before their petals decay. These are succeeded by short oblong seeds.

Culture of the HOGWEED.

These species are all propagated by seeds, which must be sown on a hot-bed in the spring; and when the plants are fit to remove, they should be each planted in a small pot, and plunged into a hot-bed, and there treated in the manner of other tender exotics.

When they are grown too tall to remain under the common frame, a plant or two of each sort should be placed in the stove, the others may be turned out of the pots, and planted in a warm border, where, if the season proves warm, they will perfect their seeds; but as these often fail in cold seasons, those in the stove will be of infinite use, as they are sure to ripen their seeds there in autumn.

The first, second, and fourth sorts are annual plants, which decay in autumn; but the third species may be preserved in a warm stove two or three years.

HOLLYHOCK, *Alcea*, a genus of plants, ranged by Linnæus among the *monodelphia polyandria*, and of which there are only two species. 1. Hollyhock with angular, sinuated leaves. 2. Hollyhock with palmated leaves.

The first species has a long, thick, and white root, hung from all parts with innumerable fibres, which spread to a great distance when they have room, and a free soil. The first leaves are very large, and placed on long foot-stalks; they are broad, short, deeply sinuated, rough, and of a dark green. The stalk is round, erect, of a pale green, a little hairy, and seven or eight feet high. The leaves on this have also long foot-stalks; they have a general resemblance of those from the root, but they are longer in proportion to their breadth, of a paler colour, and more deeply sinuated or waved at their edges, and are lightly indented between the deeper incisions. The flowers form a spike from a little above the middle of the plant to the summit, being a yard or more in length: they stand thick, and in the various appearances of half-blown, full-opened flowers, and those in the bud, they afford a pleasing variety.

The full-blown flowers are equal to a rose in size, and are of a delicate pale crimson. The outer petals, which are large and elegantly expanded, are palest; the smaller, which form a globular body in the middle, are more waved, and of a deeper red: the whole very specious and beautiful.

The second species differs in nothing from the first but the shape of the leaves, those of the former being somewhat round, and cut at their extremities into angles, and those of the latter are deeply cut into six or seven lobes, so as to resemble a hand.

Culture produces almost an infinite variety of this plant, viz. single-flowered, double-flowered, deep red, pale red, blackish red, white, purple, yellow, flesh-colour, some variegated flowers, &c. but in the whole compass of the colouring, there is no tint in which the large and fine double Hollyhock appears so truly elegant, as the

the pale crimson; nor is there any colour which is so scarce as this, in the full degree of perfection.

Culture of the HOLLYHOCK.

The several varieties of both these species may be raised by good management, from the same seed, in the following manner. When the Hollyhocks begin to flower, let the gardener pull up all bad kinds, that there may be no damage from their farina spreading, and impregnating the superior kinds, which would cause them to degenerate. This done, let the others be encouraged to flower in their full strength, by breaking the ground between them, and allowing frequent watering; and when it is seen which are most promising, let them be marked for seed, by tying each up to a firm stake. Let the head, or top of the spike be taken off, that too many flowers may not weaken the seeds ripening from the first, and if any side-shoots appear, they must be immediately taken off. When these seeds are perfectly ripe, cut off the head of the stalk, and the fruit must be taken off afterwards, and spread upon a papered shelf: turn them every day, and when quite hardened, let them be put up entire in paper bags, not shaking out the seeds, as is done on many occasions. These bags must be hung up during winter.

In the last week of March let a bed of good fresh mould be dug up in a part of the seminary which is open to the morning sun. Let it be raked level, and lie a week to settle: then take off as much of the surface as will serve to cover the seeds a quarter of an inch: then scatter on the seeds, and sift this mould over them. When the young plants come up, they will require weeding: the plants must also be thinned where they rise too close, and after this the whole bed must have a moderate watering: care must be taken in doing this, not to wash away the earth from the roots of the young plants. After this, as they advance in growth, they must be thinned from time to time, but the plants taken up are not to be destroyed, but set in a nursery bed dug for that purpose: by this means the remainder will gather strength; and when they are of a bigness to crowd one another, let the whole be transplanted: at this time they shoot only leaves; for the Hollyhock is a biennial, and its stalk for flowering does not rise till the second season.

When the leaves are so many and so large, that they crowd upon one another, let a second bed be dug up in the nursery two spades depth: the mould must be well broken, and the bed marked into squares, by lines drawn both ways, at a foot and a half asunder. In the evening of a showery day, let the plants be taken up, with as much of the mould as will come with them, and placed in the new bed, holes having first been opened in the center of each square, for their reception; care must be taken to set their roots upright, and the mould must be gathered well about them: they must be watered often till they have taken root, and after that kept clear from weeds: this is all the management they require during the summer.

In the beginning of October they are to be transplanted into the places where they are to flower, and this must also be done with care, large holes must be opened for them; they must be dug out deep, and with as much of the earth as will adhere to them; the fibres must be trimmed off at their ends, just as they are placed in the ground; the mould must be well drawn up about them, and settled by a gentle watering, which must be repeated more largely the next day, and every day afterwards, till they are well established. They will flower the succeeding summer, and they should then be tied up to firm stakes, and encouraged to blow boldly by frequent weeding, breaking the earth about them, and good waterings. After this, there should be in the same manner, a new succession raised for the succeeding year: for the plants never flower so strong or elegantly, as the first time.

HOLLY-TREE, *Ilex*, a genus of plants, ranged by Linnæus among the *tetrandria digynia*, and of which there are five species. 1. Holly-tree, with oval, acute,

spiny leaves; or the common Holly. 2. Holly-tree, with oval, spear-shaped, sawed leaves, commonly called *Dahoon Holly*. 3. Holly-tree, with oval waved leaves, whose borders are armed with strong thorns, and their upper surface prickly, commonly called *Hedge-hog Holly*. 4. Holly-tree, with wedge-shaped, three-pointed leaves. 5. Holly-tree, with winged leaves.

These are all shrubby plants. The first species grows naturally in woods and forests, in many parts of England, where it rises from twenty to thirty feet high, and sometimes more, but their ordinary height is not above twenty-five feet. The stem by age, becomes large, and is covered with a greyish smooth bark; and those trees which are not lopped, or browsed by cattle, are commonly furnished with branches the greatest part of their length, so form a kind of cone. The leaves are oblong, oval, of a lucid green on their upper surface, but pale on their under, having a strong midrib; the edges are indented and waved, with sharp thorns, terminating each of the points: some of these thorns are raised upward, and some bent downward, and being very stiff, renders them troublesome to handle. The leaves are placed alternate on every side of the branches, and from the base of their foot-stalks come out the flowers in clusters, standing on very short foot-stalks; each of these sustain five, six, or more flowers: they are of a dingy white, and appear in May; they are succeeded by roundish berries, which turn to a beautiful red about Michaelmas, and continue on the trees, if they are not destroyed, till after Christmas.

The second species grows naturally in Carolina; there are two sorts of it: one with spear-shaped, the other with linear leaves: it rises with an upright branching stem, eighteen or twenty feet high. The bark of the old stem is of a brown colour; but that of the branches is green and smooth. The leaves are more than four inches long, and one and a quarter broad, in the broadest part; they are spear-shaped, of a light green, and a thick consistence; their edges are sawed on the upper part, each serrature ending in a small sharp pine. The flowers are situated in thick clusters on the sides of the stalks: they are white, and shaped like those of the common Holly, but are smaller; in its native country these are succeeded by small roundish red berries, which make a fine appearance in winter.

The third species is a native of Canada. The leaves are not so long as those of the common Holly, and their edges are armed with stronger thorns, standing close together; the upper surface of the leaves is set close with short prickles, from whence the gardeners have given it the title of *Hedge-hog Holly*.

There are two varieties of this, with variegated leaves, one of which is yellow; and the other white.

There are also several varieties of the common Holly, with variegated leaves, which are propagated by the nursery gardeners for sale; among the most beautiful of these are the *Gold-edged Hedge-hog Holly*, *Silver-edged Hedge-hog Holly*, *Blind's Cream Holly*, *Eale's Holly*, *Herefordshire White Holly*, *Longstaff's Holly*, *Partridge's Holly*, *Cheney's Holly*, *Cream Holly*, *Milk-maid Holly*, &c. There is also a variety of this species with yellow berries, which are usually found on those plants, with variegated leaves.

The fourth and fifth species are natives of South America. They are never cultivated in this country, except in botanic gardens for the sake of variety.

Culture of the HOLLY-TREE.

The first and third species are propagated by sowing the berries in March: in order to which they should be gathered in August, as soon as they are ripe, and kept in dry earth or sand, till spring; the ground on which they are to be sown must be well dug, and cleansed from all noxious weeds, then levelled even, and the great clods broken; after this, several rills are to be drawn along it with a hoe of about two inches deep, and from one foot to two distant. In these the berries are to be laid two or three inches asunder, and the ground then drawn over them with a rake.

In the middle of April the young plants will appear. The first year they only require to be kept clean from weeds, and will make very little progress; but the year following they will grow very quick, and in the March after their sowing, the ground between the rows must be carefully and lightly dug up, which will greatly facilitate their taking root; and in April the plants which stand too close must be taken up, and transplanted to the places where they are to remain. There is much care to be taken in the transplanting them, for having a long tap-root they are not so quick in taking root in a new ground, as those which have more stringy ones.

The plants which are left in the seed-bed may remain there till autumn, and then should be transplanted into beds at about six inches asunder, where they may stand two years longer, during which time they must be constantly kept clean from weeds, and if the plants have thriven well, they will be strong enough to transplant where they are designed to remain; for when they are transplanted at that age there will be less danger of their failing, and they will grow to a larger size, than those which are removed when they are older. But if the ground is not ready to receive them at that time, they should be transplanted into a nursery in rows at two feet distance, and one foot asunder in the rows, in which place they may remain two years longer.

The several varieties of this genus are propagated by budding or grafting them upon stocks of the common green Holly. The best time to do this is after the plants have grown one year in the last nursery; but the plants so budded or grafted, should continue two years after in the nursery, that they may make good shoots before they are removed; but the plain ones should not stand longer than two years in this nursery, for when they are older they do not transplant so well.

The best time for removing Hollies is in the autumn, especially in dry land; but where the soil is cold or moist, they may be transplanted with great safety in the spring; if they are not too old, or have not stood long unremoved, for if they have, it is a great chance whether they ever succeed when removed.

The common Holly is a very beautiful tree in winter, therefore deserves a place in all plantations of ever-green trees and shrubs, where its shining leaves and red berries make a fine variety; and if the best variegated kinds are properly intermixed, they will enliven the scene. The Holly is also in much esteem for hedges, and is a very proper plant for that purpose.

The second species is propagated by seeds in like manner as the two former. The berries should be buried in the ground a year, and then taken up and sown in pots filled with light earth, and placed under a frame in winter; in the spring the pots should be plunged into a hot-bed, which will bring up the plants. These should be preserved in pots while young, and sheltered in winter under a common frame till they have obtained strength, when they may be turned out of the pots, and planted in the full ground in a warm situation.

Knee-HOLLY, or *Butcher's-BROOM*. See *Ruscus*.

Sea-HOLLY. See the article *ERINGO*.

HONESTY. See *SATIN-FLOWER*.

HONEY-Flower. See *Honey-FLOWER*.

HONEY-LOCUST, or *three-thorned ACACIA*, *Gleditsia*, a genus of plants ranged by Linnæus among the *polygamia dioecia*, and of which there are two species. Honey-locust with three thorns, winged leaves, very long broad pods, and a tree-like stalk, commonly called three-thorned Acacia. 2. Honey-locust with a few spines, winged leaves, and oval pods, containing one seed.

Both these species are natives of North America. The first rises with an erect trunk, to the height of thirty or forty feet, armed with long spines, which have two or three smaller coming out from the side; these are frequently produced in clusters at the knots, and are sometimes three or four inches long. The branches are also armed with the same sort of spines. The leaves are

winged, composed of ten pair of small leaves, which sit close to the midrib, and are of a lucid green. The flowers come out from the sides of the young branches in form of catkins; they are of an herbaceous colour. The hermaphrodite flowers are succeeded by pods near a foot and a half long, and two inches broad, divided into many cells by transverse partitions, each containing one smooth, hard, oblong seed, surrounded by a sweet pulp.

The second species has much the appearance of the first, but the spines are fewer, and very short. The leaves are smaller, and the pods are oval, containing but one seed.

Culture of the HONEY-LOCUST.

Both these species are propagated by seeds, which must be procured from the places where the trees grow naturally, as they do not ripen seeds in this country.

The seeds may be sown in spring upon a bed of light earth, burying them in the ground an inch deep, and if the spring should prove dry, they must be frequently watered; and, as sometimes they remain two years in the ground, such as are desirous to save time, should sow the seeds in pots, which may be plunged into a moderate hot-bed, to bring up the plants the same season. They must be frequently watered, and gradually inured to bear the open air: during the summer season, the plants in pots will require frequent waterings; but those in the full ground will not dry so fast, therefore need not have any water, unless the season should turn out very dry. In autumn the plants in the pots should be placed under a hot-bed frame, to protect them from frost; and those in the ground should be covered with mats on the first appearance of a frost.

The following April the plants may be transplanted into nursery beds at the distance of six inches, in rows a foot asunder. If the season should prove dry, they must be watered; and if the surface of the bed is covered with moss or mulch to prevent the earth from drying, it will be of great service to the plants. Here they may remain two years, during which time they must be kept clean from weeds; and in the winter there should be some rotten tan or other mulch spread over the surface of the ground, to keep out the frost. If the plants have thrived well, they will now be fit to transplant to the places where they are designed to remain: the best season for this is late in the spring; they thrive best in a deep light soil, for in strong shallow ground, they become mossy, and never grow large: they should also have a sheltered situation, for when they are much exposed to winds, their branches are frequently broke, in the summer season, when they are full of leaves.

HONEYSUCKLE, *Lonicera*, a genus of plants ranged by Linnæus among the *pentandriamonoecia*, and of which he enumerates fifteen species, but eleven of them only are cultivated in the English gardens. 1. Honeysuckle with whorls of flowers, sitting close at the ends of the branches, and the leaves surrounding the stalks, the *Caprifolium* of other authors, or the Italian Honeysuckle. 2. Honeysuckle with whorls of naked spikes, terminating the branches, and the upper leaves surrounding the stalk, or the ever-green Virginia *Periclymenum*, or Honeysuckle which always flowers. 3. Honeysuckle with oval imbricated heads, terminating the stalks, and all the leaves distinct, or the German Honeysuckle. 4. Honeysuckle with two flowers on a footstalk, distinct berries, and sawed leaves, being the *Chamæcerasus* of authors, or the Alpine Dwarf-Cherry, with a black twin fruit, called also black-berried upright Honeysuckle. 5. Honeysuckle with two flowers on a footstalk, distinct berries, and blunt heart-shaped leaves. 6. Honeysuckle with two flowers on a foot-stalk, distinct berries, and entire leaves, called *Xylastelum*, or the Fly Honeysuckle. 7. Honeysuckle with two flowers on a footstalk, distinct berries, and oblong smooth leaves. 8. Honeysuckle with two flowers on a footstalk, and twin berries joined together. 9. Honeysuckle with two flowers on a footstalk, globular berries which are joined, and undivided styles. 10. Honeysuckle with lateral heads growing on foot-stalks

stalks, being the *Symphoricarpos* of authors, commonly called shrubby St. Peter's Wort. 11. Honeyfuckle with bunches of flowers terminating the branches, and sawed leaves, or the *Diervilla* of authors.

These are all shrubby plants. The first, third, fourth, fifth, sixth, seventh, eighth, ninth, and tenth species are natives of different parts of Europe; and the second, and eleventh of North America.

Culture of the HONEYSUCKLE.

The first, second, and third species may be propagated by layers, cuttings, or seeds: if by layers the young shoots only should be chosen for that purpose. These should be laid in the autumn, and by the following autumn they will have taken root, when they should be cut off from the old plant, and either planted where they are to remain, or in a nursery.

When they are propagated by cuttings, they should be planted in September, as soon as the ground is moistened by rain. The cuttings should have four joints, three of which are to be buried in the ground: they may be planted in rows, about a foot distance one from the other. The plants raised by cuttings are generally preferable to those propagated by layers, because they have commonly better roots.

When these plants are raised from seeds, they should be sown in autumn soon after they are ripe; otherwise the plants will not come up the first year. They will grow in almost any soil or situation, but thrive best in a soft sandy loam.

The fourth, fifth, sixth, seventh, eighth, ninth, and tenth species, may be propagated either by seeds or cuttings. The seeds commonly lie a year in the ground before they vegetate, but require no particular culture.

The cuttings should be planted in autumn in a shady border, where they will put out roots the following spring. The next autumn they may be removed into a nursery; and in two years after they may be transplanted to the places where they are designed to remain.

The eleventh species is easily propagated by suckers which thrive best in a moist soil, and a shady situation.

French HONEYSUCKLE, *Hedysarum*, a genus of plants ranged by Linnæus among the *diadelphia decandria*, and of which he distinguishes no less than thirty-three species, but the following only are commonly cultivated in our gardens. 1. French Honeyfuckle with winged leaves, jointed, prickly, woolly pods, and a diffused stalk. 2. French Honeyfuckle with single and trifoliate leaves, and flowers in bunches. 3. French Honeyfuckle with winged leaves, jointed, prickly, waved pods, and a diffused stalk. 4. French Honeyfuckle with single, spear-shaped, obtuse leaves, and a prickly, shrubby stalk.

The first species is a native of Italy, and a biennial plant which flowers the second year, and soon after the seeds are ripe, the roots generally perish. There are two varieties of it; one with a bright red and the other with a white flower.

The second species is also a native of Italy; it has a perennial root, which will abide many years, if planted in a dry soil.

The third species is an annual plant, and a native of the Levant; and the fourth grows naturally in Syria.

Culture of the French HONEYSUCKLE.

The first species and its two varieties are propagated by sowing their seeds in April, in a bed of light fresh earth; and when the plants come up they must be removed into beds of the like earth in an open situation, at about six inches distance from each other, leaving a path between every four rows, in order for hoeing and clearing them from weeds. In these beds let them remain till Michaelmas, and then they must be transplanted into large borders of a parterre, or pleasure-garden; allowing them at least three feet distance from other plants, among which they should be interspersed to continue the succession of flowers.

The second species is propagated by seeds, which should be sown in the beginning of April, and when the plants are two inches high, they may be transplanted where they are to remain, but if they are not too thick in the bed, they may be suffered to continue there till the following autumn, at which time they should be carefully taken up and transplanted into the borders where they are designed to stand.

The seeds of the third species should be sown in April in the places where the plants are designed to stand: they will require no other culture but to thin them where they grow too close, and to keep them clear from weeds.

The fourth species is also propagated by seeds which will frequently be a year in the ground before they vegetate; therefore they should be sown in pots filled with light fresh earth, and plunged into a moderate hot-bed; and if the plants do not appear by the beginning of June, the pots should be taken out of the bed, and placed where they may have the morning sun, keeping them clear from weeds.

In the autumn let them be plunged into an old bed of tanners bark, under a frame, where they may be screened from the frost and rains in the winter, and in the spring plunged into a fresh hot-bed, which will bring up the plants. When these are fit to remove, they should each be planted into a separate small pot, filled with light earth, and plunged into a very moderate hot-bed, shading them from the sun till they have taken new root; then they should be gradually inured to bear the open air, into which they may be removed in June, placing them in a sheltered situation. Here they may remain till autumn, when if they are plunged into an old tan-bed under a frame, they will succeed better than if placed in a green-house.

American upright HONEYSUCKLE, *Azalea*, a genus of plants ranged by Linnæus among the *pentandria monogynia*, and of which there are six species, but two of them only are cultivated in the English gardens, viz. 1. American upright Honeyfuckle with a white flower. 2. Red American upright Honeyfuckle.

The first of these is a low shrub rising with several stems two or three feet high. The leaves come out in clusters at the end of the shoots without order, and their edges are set with very short teeth, which are rough. The flowers come out in clusters between the leaves, at the extremities of the branches, which are white, with a mixture of dirty yellow on their outside. They have a tube an inch long, and at the top are pretty deeply cut into five segments; the two upper are reflexed, the two side ones are bent inward, and the lower is turned downward, with five stamina a little longer than the petals; the style is much longer than the stamina. These flowers have much the appearance of those of the Honeyfuckle, and are as agreeably scented.

The second sort grows taller than the first, and in its native country, frequently rises to the height of twelve feet, but in England is never more than half that height. This has several stems with oblong smooth leaves. The flower-stalks rise from the division of the branches, which are long and naked, supporting a cluster of red flowers; they are divided at the top into five segments, which spread open. The stamina and the style are much longer than the petals, and stand erect.

Culture of the Red American upright HONEYSUCKLE.

These plants grow naturally in shade, and upon moist ground, in most parts of North America, so they must have a moist soil and a shady situation, otherwise they will not thrive. They can only be propagated by shoots from their roots, for they do not produce seeds here, and if good seeds are obtained, they are difficult to raise, and are a great time before they will flower. But when they are in a proper situation, their roots extend, and put out shoots, which may be taken off with roots, and transplanted. The autumn is the best time to remove the plants, but the ground about their roots should be covered in winter to keep out the frost, and if this is every year practised to the old plants, it will preserve them in vigour, and cause them to flower well.

HONEYWORT, *Cerinth*, a genus of plants, ranged by Linnæus among the *pentandria monogynia*, and of which there are four species. 1. Honeywort, with leaves embracing the stalks, a double fruit; and a spreading blunt corolla; or the Greater Honeywort. 2. Honeywort, with leaves embracing the stalks, indented at their points, a double fruit, and a pointed close corolla. 3. Honeywort, with entire leaves embracing the stalks, a double fruit, and a pointed, closed corolla; or Smaller Honeywort. 4. Honeywort, with narrow, spear-shaped leaves, set with prickly hairs, and four distinct seeds; or the greater Yellow Alkanet.

The first species grows naturally in Germany and Italy. It is an annual plant, and rises with branching stalks a foot and a half high. The leaves are oval, oblong, and prickly; their colour is a sea-green, spotted with white: and they embrace the foot-stalks with their base. The flowers are situated at the ends of the branches, standing between the small leaves; these are oblong, tubulous, blunt at the top, where the tube is greatly enlarged; their colour is yellow, and they have each four embryos or germen, but only two of them are fruitful. If the seeds are not taken as soon as they change black, they drop out of the empalement in a short time, and unless they are carefully gathered up, they will vegetate with the first moist weather.

The second sort is very like the first, but the leaves are larger and smooth, having no prickles on them. The flowers of this are of a purplish red colour, and the plants grow larger. This is also a native of Italy, and an annual plant.

The third species grows naturally on the Alps, and other mountainous places. It rises with very slender stalks, upwards of two feet high. The leaves embrace the stalks with their base, and are of a blueish green. The flowers are small, their upper part is deeply cut into five segments, but the mouth of the tube is closely shut up.

The fourth species grows naturally in Hungary, Austria, and Italy. It has long, narrow, thick leaves, which are covered closely with rough, prickly hairs, and spread upon the ground; between these come out the stalk, which rises a foot high; at each joint there is one leaf of the same sort, but smaller, which are placed alternately on the stalks; towards the upper part the stalks branch out into two or three smaller, upon which the flowers stand between the leaves, and form a reflexed spike; they are of a pale yellow, and shaped like those of the other sorts, but smaller.

Culture of the HONEYWORT.

All the four species are propagated by seeds, which should be sown soon after they are ripe; for if they are kept till spring, the growing quality of some of them is often lost. The plants are hardy, and if the seeds are sown in a warm situation, they will endure the winters cold without shelter.

These autumnal plants are also much surer to produce ripe seeds, than those which are sown in the spring, which are generally late in the spring before they flower; and consequently, if the autumn should not prove very warm, their seeds would not be perfected.

These plants are proper to adorn large borders in gardens, where they form an agreeable variety.

HOREHOUND, *Marrubium*, a genus of plants, ranged by Linnæus among the *didynamia gymnospermia*, and of which he distinguishes nine species. 1. Horehound, with wedge-shaped leaves, and the whorls destitute of coats. 2. Horehound, with oval, spear-shaped, sawed leaves, and bristly indentures to the cups. 3. Horehound, with woolly leaves, almost oval, the upper parts of which are indented and crenated, with awl-shaped indentures to the cups. 4. Horehound, with hairy, erect, bristly indentures to the cups. 5. Horehound, with hooked, bristly indentures to the cups; or the common White Horehound. 6. Horehound, with roundish, heart-shaped, emarginated, and crenated leaves. 7. Horehound, with spreading borders to the cups, and acute indentures. 8. Horehound, with a plain hairy

border to the cups, heart-shaped leaves, and a shrubby stalk. 9. Horehound, with the verge of the cup exceeding the tubular part in length, and their principal angle rounded.

Of these several species, which are all perennial plants, the eighth and ninth only are cultivated in gardens; they are natives of Crete, somewhat tender, and rarely produce seeds in this country.

Culture of the HOREHOUND.

The two last species are propagated by cuttings, which if planted in a shady border, about the middle of April, will take root very freely.

The other species are easily propagated by seeds, which should be sown on a bed of dry, poor earth, in the spring; when the plants come up, they must be kept clean from weeds, and where they are too close should be thinned to the distance of a foot and a half, which is all the culture they require. They may also be propagated by cuttings, like the eighth and ninth species.

HORNBEAM, or **HARDBEAM**, *Carpinus*, a genus of plants, ranged by Linnæus among the *monocia polyandria*, and of which there are only two. 1. Hornbeam, with plain scales to the cones; or the common Hornbeam. 2. Hornbeam, with inflated scales to the cones; or the Ostrya, or Hop Hornbeam.

The first species is a native of Europe and North America, and of late years has never been cultivated but for underwood, and to form hedges.

It is rarely suffered to grow as a timber tree, being generally reduced to pollards by the country people; yet, where this tree is properly planted, it grows to a large size, and may be cultivated to great advantage, by the proprietors of cold barren hills, where it will thrive, though few other sorts will grow.

The second species is a native of North America. This is a very handsome forest-tree, and of quicker growth than the common sort. It is large, and of a very good form, branched, and shadowy. The bark is brown on the trunk, and paler on the young branches. The leaves are very numerous, broad at the base, smaller to the point, and irregularly notched about the edges; their colour is a fresh and pleasing green. The flowers are of two kinds, male and female, on different parts of the same tree, both in the form of catkins, and neither conspicuous; the female are succeeded by fruit, which resembling a hop in form and colour, has given the tree the appellation of Hop Hornbeam.

Culture of the HORNBEAM.

When the common Hornbeam is propagated for timber, it should be raised from seeds upon the same soil, and in the same situation, where it is designed to grow; but when it is intended for hedges, or underwood, it may be propagated by layers. The seeds of this species should be sown in autumn, soon after they are ripe. When the plants appear, they should be cleared from weeds, and in two years time they will be fit to transplant; and as they advance in growth must be thinned, by cutting away gradually the most unpromising plants; this must be done with caution, so as not to let too much cold air, at once, on those which are left.

The second species is a hardy tree, and easily propagated by seeds, but as the young shoots take root freely, in the way of layers, that method is preferable. They should be laid in autumn in the usual manner, and not be cut off till the autumn following: they will, by that time, have very good roots, and should be planted in a nursery, to take two or three years growth, keeping them clear from weeds, and training them up to the intended form.

The usual method of propagating these trees in the nurseries, is by grafting them upon the common Hornbeam; but the graft always grows faster than the stock, so that in a short time there is a great disproportion in their size; and where they happen to stand exposed to strong winds, the graft is frequently broke from the stock, after many years growth.

HORSE-CHESNUT. See *Horse-CHESNUT*.

HORSE-

HORSE-RADDISH, a species of *Cochlearia*. This plant has a perennial root, and is a native of most parts of Europe.

Culture of the HORSE-RADDISH.

It is propagated by cuttings or buds, from the sides of old roots. The best season for doing this is in October or February: the former for dry lands, the latter for moist; the ground should be trenched at least two spades deep, and more, if it will allow of it. The manner of planting it is as follows:

Provide yourself with a good quantity of off-sets, which should have a bud upon their crowns, no matter how short they are; therefore the upper part of the roots, which are taken up for use, should be cut off about two inches long, with the bud to it, which is esteemed the best for planting: then make a trench ten inches deep, in which you should place the off-sets at about four or five inches distance, with the bud upward, covering them with the mould that was taken out of the trench: then proceed to a second trench in like manner, and continue the same till the whole spot of ground is planted. After this, level the surface of the ground even, observing to keep it clear from weeds, until the plants are so far advanced, as to be strong enough to overbear and keep them down.

With this management the roots of the Horse-raddish will be long and strait, and free from small lateral roots; and the second year after planting, will be fit for use.

HORTUS SICCUS, a dry-garden, an appellation given to a collection of specimens of plants, carefully dried and preserved.

The value of such a collection is very evident, since a thousand minutiae may be preserved in the well-dried specimens of plants, which the most accurate engraver would have omitted. We shall therefore, give two methods of drying and preserving an Hortus Siccus: the first by Sir Robert Southwell, in *Phil. Trans.* No. 237, and the other by Dr. Hill, in his review of the works of the royal society, with the doctor's objections to Sir Robert's method.

According to the former gentleman, the plants are to be laid flat between papers, and then put between two smooth plates of iron, screwed together at the corners, and in this condition set in an oven for two hours. When taken out, they are to be rubbed over with a mixture of equal parts of aquafortis and brandy: and after this, to be fastened down on paper, with a solution, of the quantity of a walnut of gum tragacanth dissolved in a pint of water.

To this the doctor objects, that the heat of an oven is much too uncertain to be employed in so nice an operation; and that the space of time, ordered for the continuing the plants in it, is of no information, unless the degree of heat, and even the different nature of the plant, as to its more or less succulency, and the firmness or tenderness of its fibres, be attended to. There are scarce any two plants perfectly alike in those particulars: and consequently the heat, and duration of heat, that is sufficient for one plant in a parcel, would destroy another. But besides this he objects farther, that the acid destroys the colour of many plants, never recovers that of others lost in the drying, and frequently, after the plant is fixed down, rots both the papers it is fixed to, and that which falls over it.

As to the doctor's own method, it is as follows: take of a specimen of a plant in flower, and with it one of its bottom leaves, if it have any; bruise the stalks if too rigid: slit it if too thick; spread out the leaves and flowers on paper; cover the whole with more paper, and lay a weight over all. At the end of eighteen hours take out the plants, now perfectly flatted: lay them on a bed of dry common sand, sift over them more dry sand, to the depth of two inches, and thus let them lie about three weeks: the less succulent dry much sooner, but they take no harm afterwards. If the floor of a garret be covered in spring, with sand two inches deep, leaving space for walking to the several parts, it will receive the collection of a whole summer, the covering of

sand being sifted over every parcel, as laid in. They need no farther care, from the time of laying them, till they are taken up, to be stuck on paper. The cement used by the doctor, is thus prepared: early in the spring put two ounces of camphor into three quarts of water, in a large bottle: shake it from time to time; and when the first collected plants are ready for the fastening down, put into a pint of the water, poured off into an earthen vessel that will bear the fire, two ounces of common glue, such as is used by the carpenters, and the same quantity of ichthyocolla, beat to shreds: let them stand six-and-thirty hours, then gently boil the whole a few moments, and strain it off through a coarse cloth; this is to be warmed over a gentle heat, when it is to be used, and the back of the plants smeared over thereby with a painter's brush: after this lay them on paper, and gently press them for a few minutes: then expose them to the air a little, and finally lay them under a small weight, between quires of papers, to be perfectly dried.

It is scarce to be conceived how strongly the water becomes impregnated with the camphor, by this simple process: a part of it indeed, flies off in the making of the cement, and the using of it, but enough remains with the plant to prevent the breeding of insects in it. He farther observes, that plants may be dried very well without sand, by only putting them frequently into fresh quires of papers, or a few, by only pressing them between the leaves of a book; but the sand method preserves the colour best, and is done with least trouble.

Another method, much better than that of the oven, is the flattening and drying the plant, by passing a common smoothing iron for linnen, over the papers between which it is laid: but for nice things, the most perfect of all methods is that by a common sand-heat, such as is used for chemical purposes. The cold sand is to be spread smooth on this occasion, the plant laid on it, carefully flatted, and a thick bed of sand sifted over: the fire is then to be made, and the whole process carefully watched, till by a very gentle heat the plant be perfectly dried. The colour of the tenderest herb may be preserved in this manner.

HOT-BEDS, in gardening, beds made with horse-dung, or tanners bark, and covered with glasses to defend them from cold winds. By the skilful management of hot-beds, we may imitate the temperature of warmer climates; by which means the seeds of plants brought from any of the countries within the torrid zone, may be made to flourish even under the poles.

The hot-beds commonly used in kitchen gardens, are made with new horse-dung mixed with the litter of a stable, and a few sea-coal ashes, which last are of service in continuing the heat of the dung. This should remain six or seven days in a heap, and being then turned over, and the parts mixed well together, it should be again cast into a heap, where it may continue five or six days, by which time it will have acquired a due heat. These hot-beds are made in the following manner: in some sheltered part of the garden, dig out a trench of a length and width proportionable to the frames you intend it for; and if the ground be dry, about a foot and a half deep; but if it be wet not above six inches: then wheel the dung into the opening, observing to stir every part of it with a fork, and to lay it exactly even and smooth on every part of the bed, laying the bottom part of the heap, which is commonly free from litter, upon the surface of the bed: and if it be designed for a bed to plant out cucumbers to remain for good, you must make a hole in the middle of the place designed for each light, about ten inches over and six deep, which should be filled with good fresh earth, putting in a stick to shew the place where the holes are; then cover the bed all over with the earth that was taken out of the trench, about four inches thick, and put on the frame, letting it remain till the earth be warm, which commonly happens in three or four days after the bed is made, and then the plants may be placed in it. But if your hot-bed is designed for other plants, there need be no holes made in the dung; but after having smoothed the surface with a

spade, you should cover the dung about three or four inches thick with good earth, putting over the frames and glasses, as before.

In making these beds care must be taken to settle the dung close with a fork; and if it be pretty full of long litter, it should be trod down equally on every part. During the first week or ten days after the bed is made, the glasses should be covered but lightly in the night, and in the day time they must be carefully raised to let out the steam; but as the heat abates, the covering should be increased, and as the bed grows cold, new hot dung should be added round the sides of it.

The hot-bed made with tanners bark is far preferable to that described above, especially for all tender exotic plants and fruits, which require an even degree of warmth to be continued for several months, which cannot be effected with horse-dung.

The method of making them is as follows: dig a trench about three feet deep, if the ground is dry; but if wet, it must not be above a foot deep at most, and must be raised two feet above the ground. The length must be proportioned to the frames intended to cover it, but it should never be less than ten or twelve feet, and the width not less than six. The trench should be bricked up round the sides to the above-mentioned height of three feet, and filled in the spring with fresh tanners bark that has been lately drawn out of their vats, and has lain in a round heap, for the moisture to drain out of it, only three or four days: as it is put in, gently beat it down equally with a dung-fork, but it must not be trodden, which would prevent its heating, by settling it too close: then put on the frame covering it with glasses, and in about ten days or a fortnight, it will begin to heat, at which time plunge your pots of plants or seeds into it, observing not to tread down the bark in doing it.

These beds will continue three or four months in a good temper of heat; and if you stir up the bark pretty deep, and mix a load or two of fresh bark with the old, when you find the warmth decline, you will preserve its heat two or three months longer. Many lay some hot-horse-dung in the bottom of the trench under the bark; but this ought never to be practised unless the bed is wanted sooner than the bark would heat of itself, and even then there should be but a small quantity of dung at the bottom.

The frames which cover these beds should be proportioned to the several plants they are designed to contain; if they are to cover the Pine-Apple, the back part should be three feet high, and the lower part fifteen inches: if the bed be intended for taller plants, the frame must be made of a depth proportionable to them; but if it be for sowing of seeds, the frame need not be above fourteen inches high at the back, and seven in the front; by which means the heat will be much greater.

A multiplying or drawing frame placed on the hot-bed is of infinite advantage for drawing curious annual plants to a due height.

This frame is composed of two, three, or more different frames, all made very exactly the same length and breadth; and each about nine or ten inches deep, except the frame for the glasses, which must be twelve inches deep in the front, and eighteen at the back. These must all be made to fix one on the top of another in a very exact manner, so that, when they are joined together, the whole may have the appearance of one frame. These frames are to be made use of in the following manner.

Begin first with the deepest, and when the plants have reached the glasses, let that be taken up, and in its place set one of the other, placing the deepest frame again on the top.

By this addition there will be a space of ten inches more in height for the plants to shoot; which when they have attained, let another frame be added, and so on till they are all fixed; always observing to place the deepest frame uppermost on account of the glasses.

HOT-HOUSE, or STOVE, in gardening, a kind of conservatory, artificially warmed, for the preserva-

tion of those tender exotic plants that are natives of the torrid zone, which without such assistance are incapable of enduring the cold of this climate.

Stoves differ from green-houses by being constantly warmed by fire; whereas green-houses are designed for less tender plants, and merely to exclude the sharpness of the external air in winter.

Of stoves there are two kinds, the dry and bark stove; and are of various constructions, according as convenience or fancy directs. Of the dry stove we must refer to the article green-house, it being more immediately connected with it. But the following is a description of a stove intended for those very curious exotics which cannot possibly exist in this country, were it not for these artificial contrivances; such as the All-Spice, Cashew, Cabbage-tree, Cocoa-nut-tree, Date-tree, Fustic-tree, Ginger, Guaiacum, Log-wood, Manæ, Manchineel, Mimosa, Bonduë, Palm, Plantain, Sugar-Cane, Sugar Apple, Tamarind, with numbers of other plants which are natives of the East and West-Indies, Africa, &c. On the plate facing this article, fig. 1, 2, 3, 4, 5, is a view of a stove of this kind with the ground plan and section; fig. 1 is a perspective view, fig. 2 a perpendicular section of the back part of the hot-house; fig. 3, a plan, with the bark beds; fig. 4, a section of the flue; and fig. 5, a view of it.

The length of this stove is twenty-two feet; and the breadth, exclusive of the shed, is five feet; the back wall one foot two inches; and the front wall nine inches. This sort of stove may be extended to any length at pleasure, allowing a fire-place for every twenty feet, otherwise the house cannot be sufficiently warmed in severe weather. The shed should be erected at the back not only to keep the back of the stove warm, but also to receive the plants when it should be necessary in winter to stir up the bark and refresh it with new; as also to shelter the fires from the winds. The front of the stove should be covered in bad weather either with tarpaulins or shutters, which will considerably add to the warmth, and save much fuel. The stove plants may be arranged according to their hardiness; those which are most susceptible of cold should be plunged in that part of the bark-bed which is nearest to the fire-place, there being the greatest heat; the other sorts which are less tender may occupy the other parts of the bed; but they all should be placed so as to form a theatrical surface; that is, the tallest plants in the back, and the shortest in front, by which disposition they will better receive the rays of the sun. In the stove there should be kept a well graduated thermometer, by which the heat may be regulated: this should be hung up in the coolest part of the house, with the back of it toward the sun, whereby the temperature of the air may be more accurately known, and the fires increased or diminished accordingly.

HOUND'S-TONGUE, *Cynoglossum*, a genus of plants ranged by Linnæus among the *pentandria monogynia*, of which there are six species. 1. Hound's Tongue with stamina shorter than the corolla, and broad spear-shaped, woolly leaves, growing close to the stalk, or the common Hound's Tongue. 2. Hound's Tongue with oval leaves embracing the stalks. 3. Hound's Tongue with the corolla twice the length of the cup, and spear-shaped leaves. 4. Hound's Tongue with stamina equalling the corolla. 5. Hound's Tongue with smooth, spear-shaped, narrow leaves, commonly called Venus Navelwort. 6. Creeping Hound's Tongue with the lower leaves heart-shaped.

The five first species are annual plants. The first is an officinal plant growing naturally by the sides of hedges and foot-ways in England and other countries in Europe.

The second species is a native of North America. The third grows naturally in Spain, and the island of Crete. The fourth is a native of the Appenine mountains, and the fifth and sixth are natives of Portugal. The sixth is a perennial plant.

Culture of the HOUND'S TONGUE.

The five first sorts are propagated by sowing the seeds in autumn in the places where the plants are to remain, and

Figure. 1.

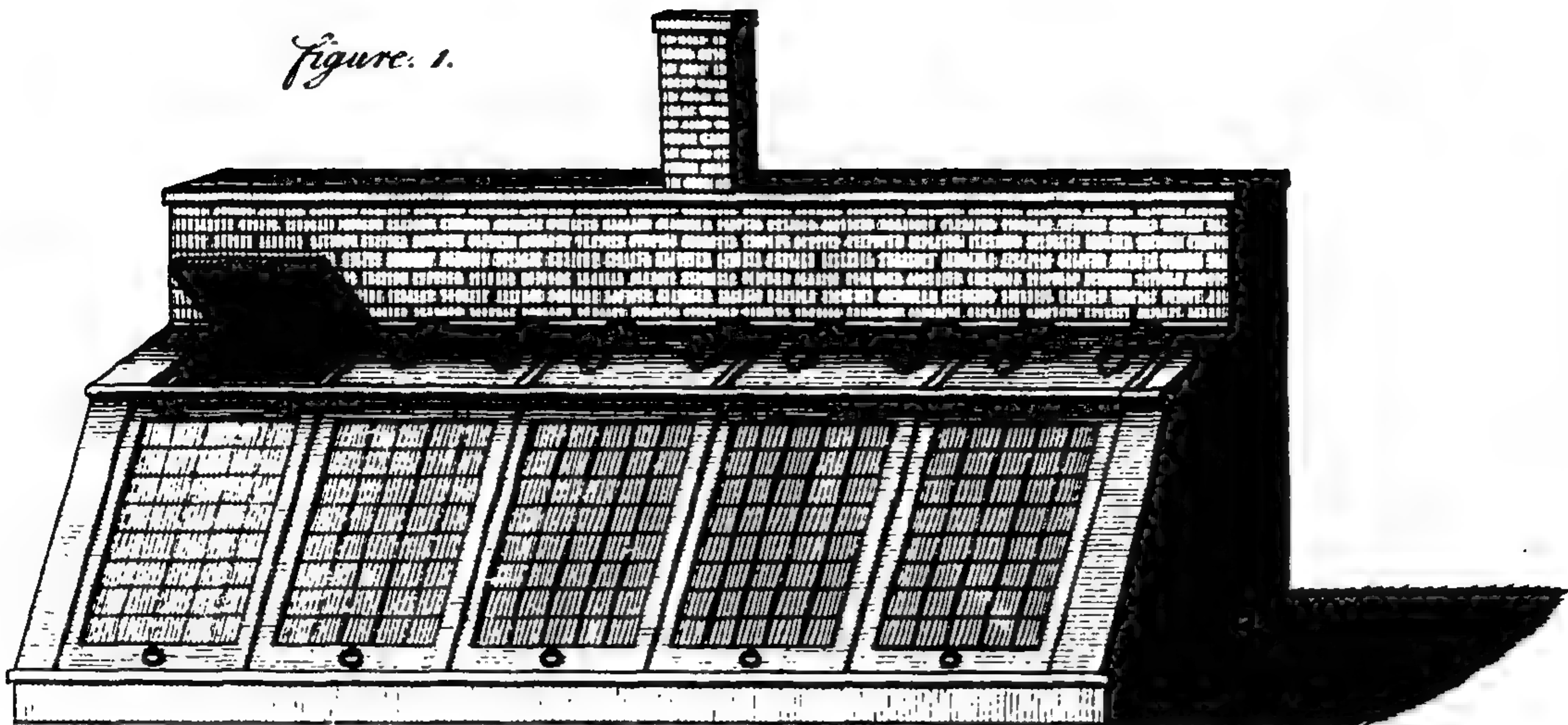


fig. 2.

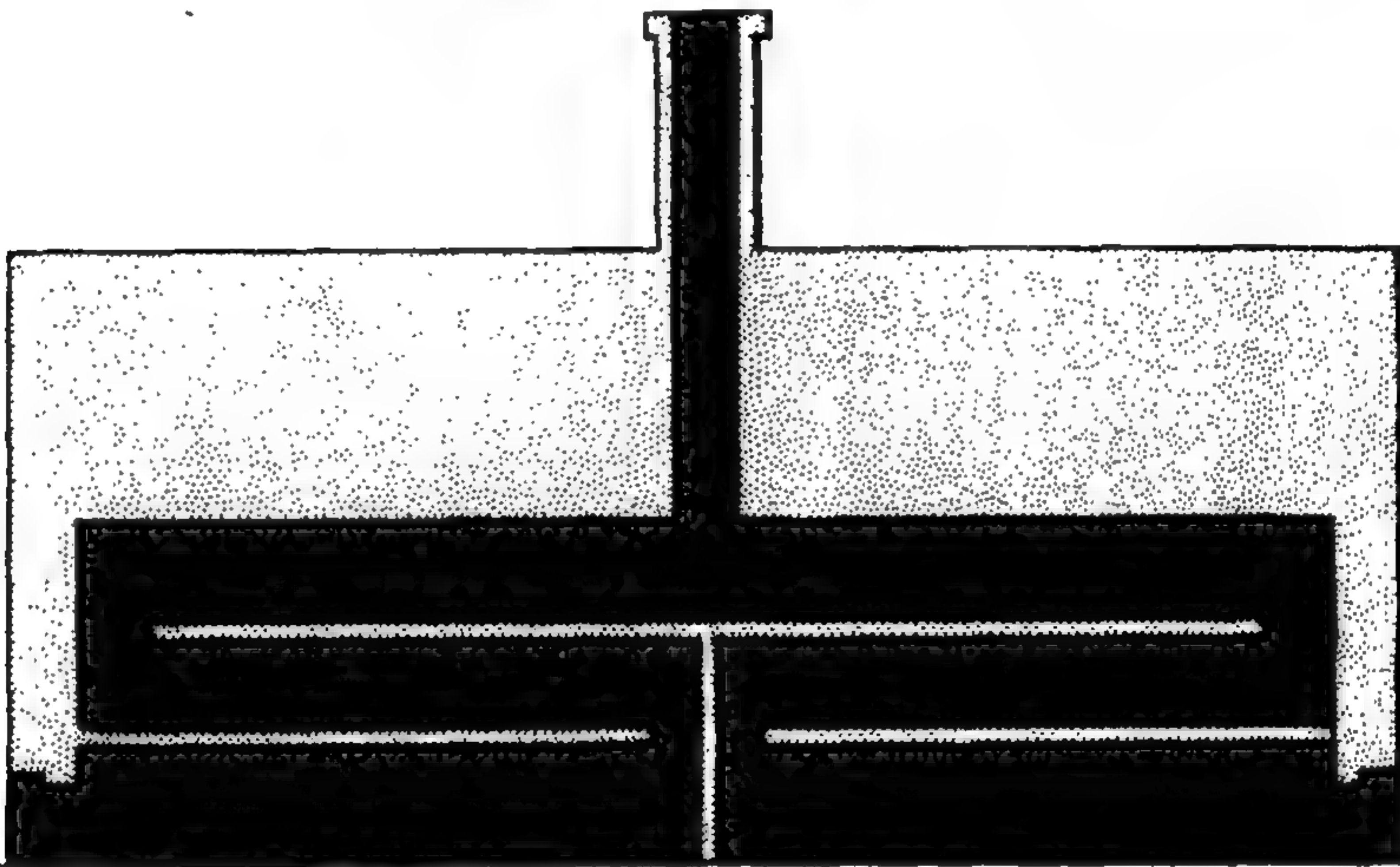


fig. 4.



fig. 3.

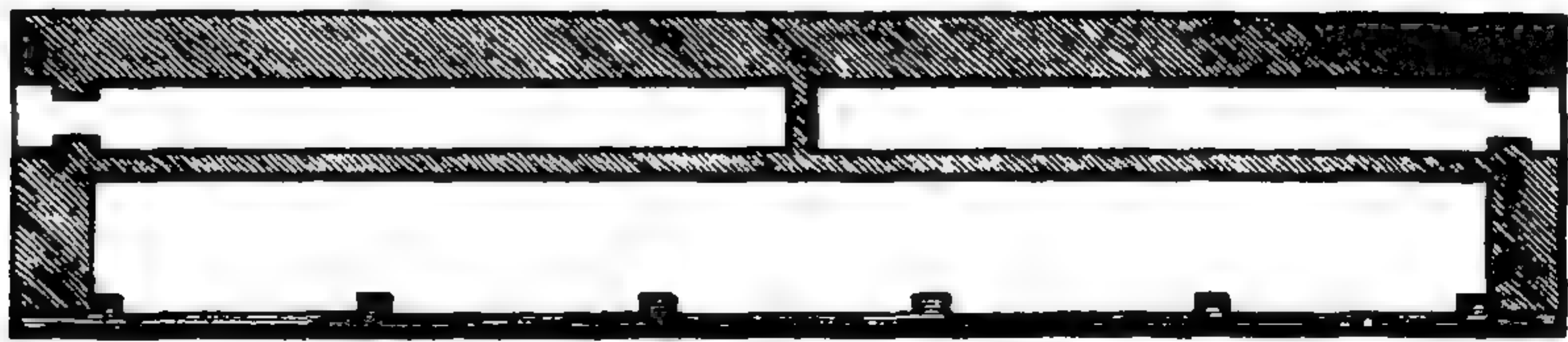


fig. 5.



1 2 4 6 12 18 Feet

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and require no other culture than to be thinned and kept clear from weeds. The sixth sort propagates itself very fast by its trailing branches which put out roots from their joints, and render any other method of culture needless. It delights in a moist cool situation.

Hore HOUND. See *HORE-Hound*.

HOUSELEEK, *Sempervivum*, a genus of plants ranged by Linnæus among the *dodecandria polygamia*, and of which there are seven species. 1. Houseleek with a smooth, tree-like, branching stalk, or Tree Houseleek. 2. Houseleek with stalks torn by the rudiments of the leaves, and blunt pointed leaves. 3. Houseleek with hairy edged leaves, and spreading off-sets, or the common large Houseleek. 4. Houseleek with hairy edged leaves, and globular off-sets. 5. Houseleek with threads from leaf to leaf, and globular off-sets. 6. Houseleek with entire leaves, and spreading off-sets. 7. Houseleek with leaves, whose borders are indented like a saw, and spreading off-sets.

The first species grows naturally at the Cape of Good Hope, and in Portugal. It has a thick fibrous root. The main stem rises eight or ten feet high, and is of a pale brown, soft, and divided into many straggling and irregular branches. The leaves grow in very beautiful regular and round series at the extremities of all the branches; they are oblong, shaped somewhat like a tongue, and of a fine fresh green. The flowers are small, but numerous; they are of a pale yellow, and of a starry form, and stand upon divided slender branches. Each flower has its little cup broke at the edge into twelve segments: the petals are also twelve, they are oblong, and pointed; the filaments are twelve naturally, but they sometimes much exceed that number; and the styles from the rudiment of the fruit are also twelve.

The second species is a native of the Canary islands. It seldom rises high unless the plants are drawn up by tender management. The stalk is thick and rugged chiefly occasioned by the vestiges of the decayed leaves; it rises about a foot and a half high, supporting at the top one very large crown of leaves, disposed circularly like a full-blown double Rose. The leaves are large, ending in obtuse points, a little incurved, succulent, soft to the touch, and pithy. The flower stalk comes out from the centre, and rises two or three feet high, branching out from the bottom, so as to form a regular pyramid of flowers, which are of an herbaceous colour. They are succeeded by horned capsules, filled with small seeds, which ripen late in autumn or winter, and then the plant dies.

The third species is the common Houseleek, which is found growing on the tops of houses and walls in every part of England. It has many thick succulent leaves set together in a round form, they are convex on their outside and plain within, short pointed, and their borders set with short fine hairs. The leaves spread open, and lie close to the earth, sending out on every side off-sets of the same form. From the centre of these heads rise the flower stalk, which is about a foot high, succulent and round, of a reddish colour, with a few narrow leaves at the bottom: the upper part of the stalk divides into two or three parts, each sustaining a spike of reflexed flowers, composed of several petals, which spread open, ending in acute points, and of a red colour, in the centre is situated the germen, which are placed circularly, and after the petals are fallen off, they swell and become horned capsules, filled with small seeds.

The fourth species is a native of the northern parts of Europe. The leaves of this sort are much narrower, and the heads are furnished with a greater number of leaves than those of the former, which grow more compact, and are closely set on their edges with hairs. The off-sets of this are globular, their leaves turning inward at the top, and lie close over each other; these are thrown off from between the larger heads, and falling on the ground take root, whereby it propagates very fast. The flower stalks of this are smaller than those of the former, and the flowers are of a paler colour.

The fifth species grows naturally upon the Alps and Helvetian mountains. This has short narrow leaves,

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grey, sharp-pointed, and have slender white threads crossing from one to the other. The flower stalks rise about six inches, are succulent, round, with awl-shaped succulent leaves, placed alternately; the upper part of the stalk divides into two or three branches, upon each of which is a single row of flowers ranged on one side above each other, composed of eight spear-shaped petals of a bright red colour, with a deep line running longitudinally in the middle; these spread in form of a star, and in the centre is situated the germen, of an herbaceous colour, surrounded by sixteen purple stamens, which are erect, and terminated by yellow summits.

The sixth species grows naturally upon the Helvetian mountains. This greatly resembles the third, but the leaves are smaller and have no indentures on their edges; the off-sets spread out from the sides of the older heads, and their leaves are more expanded. From the centre of the heads rise the flower stalks, which are nine or ten inches high; the upper part is divided into three or four branches, on which are placed the flowers; they are of a deep red, composed of twelve pointed petals, in form of a star.

The seventh species is a native of the Cape of Good Hope. It is a very low plant, whose heads spread close on the ground, and are much smaller than those of the common Houseleek. The leaves have white edges, indented like the teeth of a saw. The flowers are white and small, so make but little appearance.

Culture of the HOUSELEEK.

The first species is propagated by cuttings, which should be planted in pots, and placed in a shady situation where they will easily take root. They must have but little wet, and should be protected from frost and wet in the winter.

The second species is propagated by seeds, which should be sown soon after they are ripe, in pots filled with light sandy earth, and placed under a common frame, where they may remain till the spring, when they should be removed where they may have the morning sun only. In dry weather they must be gently watered, and always kept clean from weeds. When they have acquired strength, they must be transplanted into pots filled with light loamy earth, and placed in the shade till they have taken new root. In the summer time, let them be placed with other hardy succulent plants, in a shady situation, and in winter put in a frame, where they may be protected from hard frost, and enjoy the free air in mild weather.

The third, fourth, fifth, and sixth species are perennial plants, and extremely hardy; they are propagated by off-sets, and succeed best in a dry soil.

The seventh species is also propagated by off-sets which must be planted in pots, and sheltered from the frost in winter; and in summer may be placed abroad with other hardy succulent plants.

Lesser HOUSELEEK, *Sedum*, a genus of plants ranged by Linnæus among the *dodecandria pentagynia*, and of which there are a great number of species, comprehending several sorts of Stone crop, and Orpine, most of which are natives of England.

Culture of the Lesser HOUSELEEK, or STONE CROP, and the ORPINE.

The different sorts of Stone crop may be propagated by planting their trailing stalks, either in spring or summer, and they will thrive much better upon rocks, old buildings or walls, than the ground.

If the cuttings or roots of the perennial sorts are planted in soft mud, laid upon walls or buildings, they will soon spread into every joint or crevice, and will cover the whole place: and if the seeds of the annual sorts, which grow naturally in dry places, are sown soon after they are ripe, on the tops of walls the plants will come up without any farther care.

The several sorts of Orpine may be propagated by cuttings, during any of the summer months, or by parting their roots, either in spring or autumn: they should have a dry soil and a shady situation.

HYACINTH

HYACINTH, *Hyacinthus*, a genus of plants, ranged by Linnæus among the *hexandria monogynia*, and of which there are a great many species; among these the eight following are the most beautiful. 1. Hyacinth, with the flowers alternate, and a little drooping; or the early Blue Starry Hyacinth. 2. Hyacinth, with irregular flowers, divided into six parts. 3. Campanulated Hyacinth, with the flowers cylindric at the base, and lightly divided at the edge into six segments. 4. Hyacinth, with a clustered conic tuft of flowers; or Peruvian Hyacinth. 5. Hyacinth, with funnel-shaped flowers, lightly divided into six parts at the rim, and swollen at the base. 6. Funnel-flowered Hyacinth, with the flowers swollen at the base, and lightly cut at the edge into six segments. 7. Hyacinth, with a clustered and rounded head of flowers; or Grey Starry Hyacinth. 8. Scaly-rooted Hyacinth; or autumnal Starry Hyacinth.

The root of the first species is a large bulb, roundish, white, fleshy, and full of thick, mawkish juice. The leaves are long and narrow, pointed at the extremity, and of a deep and elegant green. The flowering stalk rises to eight or ten inches high, and is round, but a little ridged, juicy, and tender: of a whitish green at the top, but towards the base purplish. The flowers are numerous, and of a consummate beauty; they stand in a handsome spike: they are placed on the slender foot-stalks, and their weight in warmer seasons makes them droop a little; but it is not so with those which are brought to flower, nor much with any. Each flower is composed of six petals, regular in size and shape, and naturally full spread, open. They are oblong, broadest in the middle, and sharp pointed; they are placed immediately upon the foot-stalk, without any cup. The colour is naturally a fine sky-blue, but it is sometimes paler, and sometimes has a glow of the violet purple; in the most perfect state of the flower the body of the petals is of this celestial blue: and there runs along the midst of each, a line of bloody purple, which diffuses itself in a more faint tinge on each side. In the center of the flower rise six short filaments, of a violet blue, and in the midst of them a single style; this is also of a violet purple at the top, but toward the bottom whitish. The foot-stalks of the lowest flowers are considerably long, and usually they are tinged with a pale crimson.

The second species has a round root, white, and full of a slimy juice. The leaves which rise from it are naturally two: they are long, considerably broad, undivided at the edges, and obtuse at the end: they envelope one another at the base, and there cherish and defend the rudiment of the stalk. Their colour is a very beautiful green, and they are spotted with a dusky, blackish purple. The stalk is thick, round, and of a pale green, spotted in the manner of the leaves with brown, and toward the base a little tinged with purple: it rises between the two leaves, surrounded a great way up by their bases, and grows to fifteen inches in height. There are no leaves on this, but its top is decorated with a loose spike of flowers; these are in the highest degree singular, as well as beautiful: they stand at a moderate distance, and they are larger than the generality of the Hyacinth kind. Their colour is a deep yellow, dusky on the outside, and more bright within; they appear gradually and slowly after one another, which is a great recommendation; each is formed of a single petal, divided very deeply and irregularly into six segments; in the center rise six filaments, and in midst of these is placed a single style. The seed-vessel that follows each flower is short, thick, and marked with three furrows: it is divided within into three cells, and contains numerous, very minute seeds.

The root of the third species is bulbous and oblong, covered with a brown membrane, full of a slimy juice, and hung at the bottom with many fibres. The leaves are long, not very broad, pointed at the end, and of a deep green. The stalk is round, upright, naked, and a foot high, purplish toward the ground, and of a pale green upwards. The flowers cover a third part of its length, in a kind of spike; they have weak foot-stalks,

on which they hang drooping, and they are large and very beautiful. In their most natural state they are of a deep violet blue, with a light tinge of purple. The flower has no cup, but hangs naked from its foot-stalk: it is formed of a single petal, cylindric and hollow at the base, and at the rim divided into six segments, which turn outwards. The seed-vessel which follows, is of a roundish form, but marked with three furrows, and it contains a few seeds of a roundish shape, in three separate cells.

The fourth species has a large root, oblong, firm, and weighty, covered with a brown bark, and sending out, from a prominent base, many thick fibres. The leaves are very conspicuous, though not more than four or five in number: they are six or eight inches long, very broad, hollowed, obtuse, and of a fine green. The stalk is thick, juicy, and of a pale green. At the top it forms a large head, by sending out a multitude of fine slender foot-stalks; these are of a deep purplish hue: and as they are longest in the lower part of the cluster, and shorter towards the top, the whole tuft is regularly of a conic figure, thick, short, broad at the base and pointed. The flowers are extremely elegant in themselves, and this vast tuft of them makes a most splendid appearance. One terminates each of these foot-stalks; the size is considerable, the form starry, and the colour a fine blue; there is a variety of the plant, in which they are white, and sometimes fleshy, or tinged with a pale crimson: but these, though beautiful, are far below the elegant and perfect blue, which is the natural colour. In some well cultivated plants there is a glow of purple with the blue, which is extremely beautiful. The various mixture of the red gives the violet tinct to some, and to others a true purple: in all these colours the plant is of extreme beauty. As the shortness of the foot-stalks at first, in the upper part of the cluster, is owing only to their being not so full grown as those below, the continuance of the conic figure of the tuft, depends upon the manner of flowering. The flower is composed of six petals; these are of an oval form, sharp-pointed, and displayed as the rays in a pointed star. It rises naked from the foot-stalk. In the center stand six filaments, smaller upwards, short, and crowned with oblong incumbent buttons. In the midst of these rises a single style from the rounded rudiment of a seed-vessel, which when ripened, becomes oval, with three furrows, and contains, in so many cells, numerous roundish seeds.

The fifth species has a large bulbous root, composed of many thick coats, and full of a slimy juice. The leaves are oblong, and of a considerable breadth: hollowed, obtuse, of a pale green on the lower part, but deeper towards the end: six or seven of these rise together from the root, and throw themselves about in various directions. Among these rises the stalk, round, thick, upright, juicy, and ten inches high: it is brownish in the upper part, but of a paler green near the ground. There are no leaves on it, but from the middle to the top it is very elegantly decorated with flowers. These are hollow, of a bell-like shape, divided at the edges into six parts, and swollen into a kind of roundness at the base; they hang from the stalks by short slender foot-stalks, of a brownish green principally, but not entirely on one side: and they are of an extremely beautiful blue, and of a very sweet scent; sometimes there is a mixture of purple with the blue, sometimes they are white, and sometimes they are fleshy: these, and numerous other varieties of them, are produced from seeds, of which we shall speak hereafter; but what is here described, is the original, or mother plant. The flower is formed of a single petal, and from the base there rise six filaments, short, and terminated by convergent buttons: in the center of these rises a single style, terminated by an obtuse top. The seed-vessel is of a roundish form, marked with three ridges, and contains in three cells a few large roundish seeds.

The root of the sixth species is very large, round, and white, full of juice, and hung with many thick fibres.

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The leaves are numerous, broad, and very conspicuous; they resemble those of the Lilly: they are of a fresh green, waved at the edges, and often curled or twisted. The stalk is round, firm, fourteen inches high, and upright, except that it bends toward the top with the weight of its numerous large flowers. The lower part of it is variously and elegantly clouded and spotted with purple: and usually the bottoms of the leaves are in the same manner pointed like the stalk of the great Dragons. The flowers are very large, and naturally of a celestial blue; they hang in great clusters from the top down one third of the length of the stalk: each has its short foot-stalk. In form they resemble the other Hyacinths, but they are the largest of their kind: and by culture their colour will be changed in many degrees; it will grow deeper or paler: there will be a mixture of red in various proportions with the blue, which will make it purple: and it will sometimes be fleshy or white. These are all fine colours, and the flower is very elegant in all of them, but in none so truly fine as in its pure celestial blue, its genuine and natural colour. The flower is formed of one petal, and grows naked to its foot-stalk: it is rounded at the base, cylindric and tubular in the body, and at the rim it turns up in six large and elegant segments. Within stand six short filaments, whose buttons converge: and there is in the center of these a short style, with an obtuse head.

The seventh species has a roundish root, it is white, and hung with many fibres at the base. The leaves are numerous, and moderately broad, straited, and of a faint green. The stalk is round, thick, of a pale green and naked. The flowers are numerous, and they crown the top in a broad tuft. Their colour is a very delicate pearly grey, and the smell is very fine. The flowers have no cups. Its body is composed of six oval petals, which stand expanded in the manner of the rays of a star. Within stand six short filaments, with oblong incumbent buttons; and in their center, from a roundish rudiment, rises a simple style of the length of the filaments, and crowned with a single head.

The root of the eighth species is large and white, and is composed of scales in the manner of the Lilly root, but thicker and shorter. The leaves are numerous, broad, oblong, obtuse, and of a strong green; the middle rib is pale, and sometimes the ends of the leaves are tipped with brown. The stalk is round, juicy, and a foot high; there are no leaves on it; the colour is a pale green, tinged toward the bottom with red, and the top is decorated with a great number of flowers. These are large, and of a delicate white, sometimes tinged a little with a flesh colour. They have no cup: they rise naked from their foot-stalks, and each is composed of six petals, which stand open. In the center are six short filaments, crowned with oblong incumbent buttons, and in the midst of them a single style with a simple head. This rises from a roundish rudiment of a seed-vessel, which, as it ripens, becomes more oval, and is marked with three furrows. It is formed of three valves, and divided within into three cells, in each of which are contained several roundish seeds.

Culture of the HYACINTH.

All the kinds of this beautiful flower may be propagated either by sowing their seeds, or by parting their bulbous roots. The latter is generally practised among us, though the former is evidently the best way to procure the finest varieties of the flowers, and has been always practised in Holland. The discouragement in this, is the long time the plants take from the sowing, which is usually four years before they flower; but then, if they are sowed every year, after the first four years, there is always a yearly succession of flowers from seed. The seed should be carefully saved either from semi-double, or the finest single flowers, and sown on a fresh, light, and somewhat sandy soil, in shallow pots or boxes, covering them with half an inch of the same earth. This should be done in the beginning of August, and the pots should be placed where they may have the morning sun till the middle of September: and towards

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the end of October, be put under a common hot-bed frame. In February the young plants will appear above the ground, and must be carefully screened from frosts: but they must not be close covered, except at nights. In March they must be taken out of the frames, and set in a warm place: and when the weather is dry, they must be gently watered at times, and always kept clear from weeds. About the latter end of April, or beginning of May, they must be removed into a cooler situation, as the heat of the sun would then be too much for them. After their blades are decayed, they must have no more watering; but toward the latter end of August, about half an inch of fresh earth should be sifted over the pots; after this they must be preserved and managed as the former season: and in the August following a bed of light, rich, sandy soil, should be prepared; then the earth is to be taken out of the pots or boxes: and the roots, which will at this time be about the bigness of a quill, must be separated, and carefully placed upon the bed, at two or three inches asunder. They are to be set with bottom part downwards, and covered two inches thick, with the same fine earth sifted over them. These beds must be arched over, and in frosty weather covered with mats. In spring, if the weather proves dry, they must be watered sparingly. In summer they must be kept very clear from weeds, and in autumn have an inch more of light earth strewed over them. This management must be continued till they flower, which is usually not till four or five years after they were sown. When they are in flower, the finest sort should be marked with a stick, that they may be taken up and planted separate. When the green leaves of these plants begin to decay, their root must be taken up, and the earth of the bed being raised into a ridge, to shoot off the moisture, they should be laid into the earth again, in an horizontal position, leaving the green leaves hanging down from the roots, to prevent their moisture from running into the roots, which often rots them. When the leaves are quite dried off, the roots are to be taken up and cleared of filth, and laid up in boxes till September, which is the time for planting them again. The proper soil for planting these in is this: take one half fresh earth from a common or pasture, which is of a sandy loam: this should not be got beyond nine inches deep; to this add a fourth part of rotten cow-dung. This should be mixed a long while before it is used, and often turned: and should be spread ten inches deep on the beds, with a little rotten cow-dung, or old tanners bark, at the bottom. These beds should be raised from three to six inches above the surface of the earth, and be a little rising or rounded, in the middle. When the flowers are about to blow, the stalks should be fastened by a loop of wire to a small stick, to prevent their bending down, and they must be sheltered from the great heat of the sun in the middle of the day, by which means they will continue in flower a month or longer.

Grape HYACINTH. See *GRAPE Hyacinth*.

HYDRANGÆA, a genus of plants, for which there is no English name, and only one species.

This plant is a native of North America. It has a spreading fibrous root, from which are sent up many soft, pithy, ligneous stalks, which rise about three feet high, with two oblong, heart-shaped leaves placed opposite, at each joint; they are three inches long, and two broad near their base, sawed on their edges, and have many veins running from the middle upward to their borders. The flowers crown the top of the stalks, in form of a corymbus; they are white, and composed of five petals, with ten stamina surrounding the style.

Culture of the HYDRANGÆA.

It is easily propagated by parting of the roots: the best time for doing this is the latter end of October, at which season they may also be transplanted. The plants should have a moist soil, for they grow naturally in marshy places; they require no other culture than to be kept clean from weeds, and to have the ground dug about them every winter. The roots are perennial, and if in

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very severe frost the stalks are killed, they will put out new ones the following spring.

HYGROMETER, or **HYGROSCOPE**, a machine or instrument for measuring the degrees of dryness or moisture of the air, or atmosphere. There are divers sorts of hygrometers, for whatever body either swells or shrinks, by dryness or moisture, is capable of being formed into an hygrometer. It is found that moisture sensibly shortens the length of cords and strings. Therefore to make an hygrometer, no more is necessary than to suspend a catgut a yard in length, having a plumbet, or piece of lead, with an index or pointer affixed to the lower end of it, by which means the catgut will twist or untwist as the air dries or moistens, and shorten or lengthen, so as to raise or sink the plumbet with the index; and this index will point the degree sought for. The degrees may be marked upon a open brass screw within, with which the plumbet and index has its motion. The following hygrometer is recommended in the Philosophical Transactions, No. 479. It consists of a thin piece of sponge, so cut as to contain as large a superficies as possible. This hangs by a fine thread of silk upon the beam of a balance, and is exactly balanced on the other side by another thread of silk, strung with the smallest lead shot, at equal distances, and so adjusted as to cause an index to point at the middle of a graduated arch, when the air is in a middle state, between the greatest moisture and the greatest dryness. Under this silk so strung with shot, is placed a little table or shelf for that part of the silk and shot which is not suspended to rest upon. When the moisture imbibed by the sponge increases its weight, it will raise the index, and also part of the shot, from the table, and vice versa when the air is dry.

HYPECOUM, a genus of plants for which we have no English name; there are three species of it. 1. Hypocoum with compressed jointed pods bent inward. 2. Hypocoum with taper, cylindrical, nodding pods. 3. Hypocoum with taper, erect, wreathed pods.

The first species has many winged pointed leaves, of a greyish colour, which spread near the ground. The stalks are slender and lie prostrate, they are naked at the bottom, but at the top are placed two or three small leaves of the same shape and colour with those below: between these leaves are situated the foot-stalks of the flowers each sustaining one yellow flower with four petals, and a pointal stretched out beyond the petals, which afterward turns to a jointed compressed pod about three inches long, which bends inward like a bow, having one roundish compressed seed in each joint.

The second species has slender stalks which stand more erect, the segments of the leaves are longer, and much narrower than those of the first: the flowers are smaller, and situated at the divisions of the branches, they are succeeded by narrow taper pods hanging downwards.

The third species has greatly the appearance of the second both in leaf and flower, but the pods grow erect, and are wreathed and twisted about.

Culture of the HYPECOUM.

These plants are all annual; their seeds should be sown in the autumn on a bed of fresh earth where they are to remain, for they seldom succeed when they are transplanted.

When the plants come up, they should be carefully cleared from weeds, and where they are too close they must be thinned, leaving them about six or eight inches apart; after this they will require no other culture than to be constantly kept clear from weeds.

HYPOCIST, a species of *Asarabacca*. See the article **ASARABACCA**.

HYSSOP, *Hyssopus*, a genus of plants ranged by Linnæus among the *didynamia gymnospermia*, and of which there are three species. 1. Hyssop with fruitful spikes, or the common Hyssop. 2. Hyssop with transverse petals, and the lower stamina shorter than the petal. 3. Hyssop with an acute square stalk.

The first and second species are perennial plants, and

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the third biennial. The first is a native of the Levant, the second grows naturally in Siberia, and the third in Canada. These plants when not in flower may be known by their long narrow leaves, and peculiar agreeable scent.

Culture of the Hyssop.

All the species are propagated either by seeds, or cuttings. The seeds must be sown in March, on beds of a light sandy soil, and when the plants are come up, they must be cleared to a foot asunder every way; or if they are intended to remain many years, they should be left at two feet distance, for they grow quick, and spread very much. They thrive best on a poor soil, and will bear the severities of the winter much better than on a richer.

When they are propagated by cuttings, it must be done in April or May, when they should be planted in a border where they may be defended from the violent heat of the sun, and being frequently watered, they will take root in two months, after which they may be transplanted to the places where they are to remain, managing them as the seedling plants.

Hedge HYSSOP, *Gratiola*, a genus of plants of which there are three species. 1. Hedge Hyssop with flowers standing on footstalks, and spear-shaped sawed leaves. 2. Hedge Hyssop with obtuse indented leaves. 3. Hedge Hyssop with flowers sitting close to the branches.

The first species grows naturally on the Alps, and other mountainous parts of Europe. The second is a native of North America, and the third of Carthage.

Culture of the Hedge Hyssop.

It is easily propagated by parting the roots in autumn, when the stalks decay; the plants should have a moist soil and a shady situation, in which they will thrive extremely well; but in dry ground they often decay in summer, unless they are plentifully watered.

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JACK-IN-A-BOX. See **HERNANDIA**.

JACOB'S LADDER, or Greek Valerian. See the article **GREEK VALERIAN**.

JALAP. See **MARVEL OF PERU**.

JANUARY, the first month of the year.

In the *Flower-garden*, take the advantage of a fine day some time this month, and plant some Ranunculuses, and other spring-flower roots, for when these put into the ground the preceding autumn are decayed, these will come in season, and continue to the time of the summer flowers. As many of the hardy shrubs must be sown in the beginning of the succeeding month, preparation must be made now. If the weather is frosty, nothing more is to be done, but overlooking the ground and defending the crops, by srewing pease-straw over some, and drawing mats or cloths over the hoops of the others. About the beginning of this month the Auriculas are to be prepared for flowering well, by fresh earthing. Look over the beds of those Tulip roots planted in autumn; such as are come up should be covered with mats and drawn over the hoops placed upon the beds, as often as is necessary. A covering of pease-straw should be laid upon the beds of Carnation and other choice flower-buds, if the season is hard, but those coverings should be removed in mild weather; and, as toward the end of this month the frost may be more dangerous than ever to seedling-plants, great care must be taken to preserve them.

In the *Kitchen-garden*, look over the Cauliflower plants under glasses. Lay some straw upon the mushroom beds, to preserve them from frost and wet, and change it once in three days. Plant Endive for seeds:

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let all tender crops be defended from cold and wet, by mats on hoops, or by pease-straw. Let Lettuce-seeds of the common sort be sown in some well sheltered place, and let a small crop of Peas and another of Beans be now sown, and let a bed be prepared for Carrot-feed. Lay in another crop of Endive for blanching. Chuse a mild and moist day to make a plantation of early Cabbage, in a rich and dry soil. About the end of the month, let hot-beds be prepared for raising early Cucumbers and Melons. Search should be made after caterpillars and snails.

In the *Seminary*, let the beds intended for planting in spring have their last turning, and let the whole be thrown up in a new ridge. Let the young trees of the hardy kind be pruned and trimmed up, and let their roots be defended by covering the ground with pease-haulm. Let the ground be dug between such shrubs and trees as are well established in their growth, and all roots of perennial weeds carefully picked up. The young trees must be examined to see whether they be cropped or barked; if any such mischief appear, look well to the fences, and lay traps about the feed-beds; repeat the sowing of flowers whose seeds will grow at this period.

Fruit-garden. About the beginning of this month is the season for providing an early crop of Strawberries. The Apple-tree, Pear-tree, and the small shrubs of Gooseberries and Currants may now be pruned. Let the young Mulberry-trees be now examined; let there be no dead wood or decayed branches left. Clear the fruit-trees from moss. About the end of this month the business of pruning may be continued. The gardener should now think of the great affair of grafting.

In the *Green-house*, if the middle of the days be mild, give the plants air. But if the frost be severe it must be kept close; and if the frost continues hard, let mats be placed before all the glasses; and if there is a flue under the green-house, there must be a little fire used to keep the air in a gentle warmth; and where there is no flue, let some clear fire be made in a portable furnace, or several wax candles be kept burning, while the windows are close; let the waterings be very sparing: all the dead leaves must be taken off and carried out of the green-house, and wherever there appears any mouldiness let it be carefully and perfectly cleared off with a sponge dipped in warm water. The same care must be taken in the case of insects, only instead of warm water alone, let the sponge be wetted in a strong and warm decoction of wood foot, and tobacco.

In the *Stove* the same kind of care must be taken but in a greater degree. If the heat is not carefully kept up, the trouble will be all in vain. Care must be taken to carry all the dead leaves out of the house, and let such plants as require water have it regularly, but in small quantities. About the end of this month it will be proper to repair the bark-bed in the stove: and a fine day should be chosen for that purpose: observe to let the heat of the air be carefully kept up by the thermometer.

JASMINE, or JESSAMINE, *Jasminum*, a genus of plants ranged by Linnæus among the *diandria monogynia*, and of which there are seven species. 1. Jasmine with winged leaves placed opposite, or the common White Jasmine. 2. Azorian Jasmine with trifoliate leaves placed opposite, commonly called Ivy-leaved Jasmine. 3. Jasmine with trifoliate and single leaves placed alternate, and angular branches, or the common Yellow Jasmine. 4. Jasmine with alternate, trifoliate, winged leaves, and angular branches, or the Italian Yellow Jasmine. 5. Jasmine with alternate, trifoliate, winged leaves, and taper branches, or the sweet-scented Yellow Indian Jasmine. 6. Jasmine with spear-shaped leaves placed opposite, entire acute empalements, and one flower upon each footstalk. 7. Jasmine with winged leaves placed opposite, whose lobes are shorter and obtuse; or Catalonian Jasmine.

The first species, which is the common White Jasmine, is a native of several parts of India. It has long

been inured to our climate, where it thrives and flowers extremely well, but never produces any fruit here.

The second species is a spreading shrub, not very regular in growth. The trunk is covered with a pale grey bark; the young shoots are soft, tender, flexible, and green. The leaves are placed regularly in threes, and these again in pairs upon the stalks: one foot-stalk supports three leaves, and these foot-stalks rise opposite to one another. The single leaves are large, of a deep green, and an oval shape: they are broadest at the base, and smaller at the point. The flowers are disposed in tufts at the extremities of the branches, each foot-stalk splitting naturally, and supporting two of them. The whole tuft when in full glory is composed of eight or nine pair of these flowers. Each flower is large and white, and much resembles that of the common Jasmine, which it exceeds greatly in fragrance.

The third species or common Yellow Jasmine is very seldom cultivated in gardens, for the flowers having no scent, are little esteemed.

The fourth species, or the Italian Yellow Jasmine, has larger flowers than the former, but they have also very little scent.

The fifth species is a native of India. It rises with an upright woody stalk eight or ten feet high covered with a brown bark, sending out several strong branches which want no support. The leaves are trifoliate, oval, entire, and of a lucid green which continues all the year. The flowers are situated at the ends of the shoots in bunches of a bright yellow, and have a most delicate odour. They appear in July, August, September, and October; and sometimes continue till the end of November, they are frequently succeeded by oblong oval berries, which turn black when ripe, and have each two seeds.

The sixth species has a large woody stem, sending out many branches, which are at first green, but afterwards the bark becomes grey, and is smooth; the branches come out by pairs, and have short joints; the leaves, which are of a thick consistence, are also set by pairs close to the branches: they are five inches long, and two and a half broad in the middle, lessening to both ends, terminating in a point of a lucid green, and having several transverse veins from the mid-rib to the borders, which are entire. The flowers are produced at the ends of the branches, fitting close to the leaves, one upon each foot-stalk; they have a tubulous empalement, with five corners or angles, cut deep at the brim, into five long, narrow segments, ending in very acute points; the flower has but one petal: for though it is cut into many deep segments at the top, yet these are all joined in one tube below: some of these flowers are much more double than others, having three or four orders of petals; when fully blown they are as large as a middling Rose, and some of them are as double as a damask Rose, having a very delicate odour, not unlike that of the White Narcissus. The season for its flowering is in July and August.

The seventh species is a native of India. It has much stronger branches than the common white sort. The leaves are winged, and composed of three pair of short obtuse lobes, terminated by an odd one, ending in obtuse points; these lobes are placed closer than those of the common Jasmine, and are of a lighter green. The flowers appear from the wings of the stalks, standing on long foot-stalks, each sustaining three or four flowers, which are of a blueish red on their outside, but white within.

Culture of the JASMINE.

The first species may be propagated by laying down the branches, which will take root in one year, and may then be cut from the old plant, and planted where they are designed to remain.

It may also be propagated by cuttings, which should be planted early in the autumn; and if the winter should prove severe, the surface of the ground between them must be covered with tan, sea-weed, ashes, or saw-dust, which will prevent the frost from injuring their roots.

When these plants are removed, they should be planted where they are designed to remain, which should be

be either against a wall, pale, or some other fence, where the flexible branches may be supported. These plants should be permitted to grow rude in the summer, otherwise there will be no flowers; but after they are past, the luxuriant shoots should be pruned off, and the others nailed to the support.

There are two varieties of this species, with variegated leaves, one with white and the other with yellow stripes, but the latter is the most common; these are propagated by budding them on the plain Jasmine, and it often happens, that when the buds do not take, yet they will communicate their gilded miasma to the plants; so that in a short time after, many of the branches both above and below the places where the buds have been inserted, have been thoroughly tinged.

Both these varieties should be planted in a warm situation, especially the white striped, for they are much more tender than the plain, and are very subject to be destroyed by frosts: therefore the white striped should be planted to a south or south-west aspect, and in very severe winters their branches should be covered with mats or straw, to prevent their being killed; the yellow striped is not so tender, so may be planted against walls to east or west aspects: but these plants with variegated leaves, are not so much in esteem as formerly.

The best way of propagating the second species, is by layers; chuse for the mother plant one that is vigorous and healthy: and having fixed upon the branches that are fit for laying, raise three tressels or frames of any kind under them, able to bear pots of earth: then mix together three bushels of fine rich mould, taken from under the turf in a fertile meadow: add to it one bushel of earth from the bottom of a wood-pile, and half a bushel of old cow-dung: blend all these well together; and when they have lain some time, fill with this compost three large pots; set each upon one of the tressels, and let it be of such a height, that the branches intended to be laid, will come down to it without much force; bring down the branch to the first pot, open the earth six inches deep, and lay it in; observe where the part to be covered is, and then let it rise again: tie a piece of wire just above, and cut with a knife three long slits, in the part that will lie covered; after this, pierce half a dozen holes in the earth, and then wet it with strong brine: then lay it in the open part of the earth, and fasten it securely with pegs, or by tying: cover it up five inches with the earth, and give it a gentle watering.

The best season for laying it is in the beginning of August, for this is an evergreen: and this is a proper time for them; it is thus to be managed with every branch that is laid, and the top of each should remain about eight inches out of the ground: the earth must be gently watered, and the next season the branches are to be cut off from the old plant, and the whole earth of the pot shaken out in a lump with the layer: it is then to be placed in another pot, with more earth of the same kind, and the shoot is to be kept in the middle of the pot. It will thus require no more care than is bestowed on common plants of the same kind, and will grow to a handsome shrub; these pots must be set out in the latter end of May, and taken into the green-house in August: and every year the earth must be cleared away to a good depth about the roots, and fresh put in the place of it: with this management they will produce very large bunches of fine flowers, and of great sweetness. A layer or two should be placed under a south wall in the natural earth, at the same time that others are set in pots; these will stand some winters, though very severe ones will destroy them: but so long as they bear the exposure, they will grow more luxuriantly, and flower in a much finer manner than such as are housed.

The third species is easily propagated by suckers or layers.

The fourth species may be propagated by laying down the tender branches, as was directed for the common white sort: or by inoculating or inarching it upon the common Yellow Jasmine, the latter of which is preferable, by making the plants hardier than those which are obtained from layers.

The fifth sort is propagated by laying down the tender branches; the shoots should be laid down in March, and if they are slit at the joint, as it is practised in laying of Carnations, it will promote their rooting; when the weather is dry, these layers must be frequently watered, which if carefully attended to, the plants will be rooted by the succeeding spring fit to be transplanted, when they must be planted in pots filled with light earth, and managed as was before directed for the seedling plants. This sort is frequently propagated, by inarching the young shoots into stocks of the common Yellow Jasmine, but the plants so raised do not grow so strong as those which are upon their own stock; besides, the common Yellow Jasmine is very apt to send out a great number of suckers from the root, which renders the plant unsightly; and if these suckers are not constantly taken off as they are produced, they will rob the plant of their nourishment. The cuttings of this plant will also take root, if they are planted in pots in the spring, and plunged into a moderate hot-bed, covering them close with handsome glasses; when these are well rooted, they may be transplanted into separate pots, and treated as the layers. The sixth sort is easily propagated by cuttings, which, if taken from the young branches, and planted in pots filled with a loamy soil, and plunged into a moderate hot-bed, covering them close down with hand-glasses, will soon put out roots: then they may be transplanted each into a separate small pot, filled with the like loamy earth, and plunged again into the hot-bed, to forward their putting out new roots. When these young plants have obtained strength, they may be treated hardily.

The seventh species is propagated by inoculating or inarching it upon the common White Jasmine, on which it shakes very well, and is rendered hardier than those which are upon their own stocks. Those of this kind are brought over from Italy every spring, generally tied up in small bunches, containing four plants; their roots are wrapped about with moss to preserve them from drying, which, if it happens that the shrip has a long passage, will often occasion them to push out strong shoots from their roots, which must always be taken off before they are planted, otherwise they will exhaust the whole nourishment of the plant, and destroy the graft. In making choice of these plants, you should carefully observe if their grafts are alive and in good health: for if they are brown and shrunk they will not push out, so that there will be only the stock left, which is of the common sort.

When you receive the plants, you must clear the roots of the moss, and all decayed branches should be taken off; then place their roots into a pot or tub of water, which should be set in the green-house, or some other room where it may be screened from the cold: in this situation they may continue two days, after which you must prune off all the dry roots, and cut down the branches within four inches of the place where they are grafted, and plant them in pots filled with fresh light earth; then plunge the pots into a moderate hot-bed of tanners bark, observing to water and shade them, as the heat of the season may require. In about three weeks or a months time they will begin to shoot, when you must carefully rub off all such as are produced from the stock below the graft; they must now have a great share of air to strengthen them, and by degrees they must be hardened to endure the open air, into which they should be removed in June, placing them in a warm situation the first summer; for if they are too much exposed to the winds, they will make but an indifferent progress, being rendered tender by the hot-bed. If the summer proves warm, and the trees have succeeded well, they will produce some flowers in the autumn following, though they will be few in number, and not near so strong as they will be the succeeding years, when the trees are stronger, and have better roots.

These plants are preserved in green-houses, with Oranges, Myrtles, &c. in the winter season, and require the same treatment; but notwithstanding most people preserve these plants in green houses, yet they will

will endure the cold of our ordinary winters in the open air, if planted against a warm wall, and covered with mats in frosty weather, in which situation they will produce ten times as many flowers in one season, as those kept in pots, and the flowers will likewise be much larger; but they should not be planted abroad till they have some strength, so that it will be necessary to keep them in pots two or three years; and when they are planted against the wall, which should be in May, that they may have taken good root in the ground; before the succeeding winter you must turn them out of the pots, preserving the earth to their roots, and nail up their shoots to the wall, shortening such of them as are very long, that they may push out new shoots below to furnish the wall, continuing to nail up all the shoots as they are produced.

In the middle, or towards the latter end of July, they will begin to flower, and continue to produce new shoots till the frost prevents them. Toward the middle of November, if the nights are frosty, you must begin to cover your trees with mats, which should be nailed pretty close, but this should be done when the trees are perfectly dry, otherwise the wet being lodged upon the branches, will often cause a mouldiness upon them, and the air being excluded therefrom, will rot them in a short time; it is also very necessary to take off these mats when the weather will permit, to prevent this mouldiness, and only keep them close covered in frosty weather; if a little mulch is laid upon the surface of the ground about their roots, and some bands of hay fastened about their stems, to guard them from the frost in very severe weather, it will preserve them; in the spring as the weather is warmer, so by degrees the covering should be taken off, but they should not be exposed too soon to the open air, for the morning frosts and dry easterly winds, which often reign in March, do frequently pinch these plants if they are too early exposed.

When the covering is taken off, the trees should be pruned, and cut out all the decayed branches, shortening the strong shoots to about two feet long, which will cause them to shoot strong, and produce many flowers.

American JASMINE. See IPOMOEA.

Arabian JASMINE, a genus of plants, ranged by Linnæus among the *diandria monogynia*, and of which there are five species. 1. Arabian Jasmine, with a four-cornered stalk, with oval, acuminate leaves, and compressed, membranaceous seed-vessels. 2. Arabian Jasmine, with the lower leaves heart-shaped and obtuse, and the upper leaves oval and sharp-pointed. 3. Arabian Jasmine, with oval, pointed, and waved leaves, and with round branches. 4. Arabian Jasmine, with the foot-stalks of the leaves and flowers hairy; or the Sorrowful Tree. 5. Arabian Jasmine, with obtuse, spear-shaped, oval leaves.

These are all shrubby plants, and natives of India. They require one method of culture, and are great ornaments to a garden: especially the first species, which, if kept in a proper temperature of warmth, will continue flowering great part of the year.

Culture of the Arabian JASMINE.

These plants are never cultivated with better success than when grafted on the common Jasmine.

The gardeners of Italy, under whose hands that operation succeeds happily, furnish all Europe with them ready for planting. These plants arrive in spring, and are to be treated as follows:

Let the whole plant, root and branches, be thoroughly washed, so that no moss is left about the roots; if any branches are decayed, or any shoots risen from the roots, they must be carefully taken off. Let the plants remain two days soaking in water, then prune the roots, and plant them in pots filled with fresh mould, and wood-pile earth: set the pots up to the rim in a bark-bed that has but a moderate heat; they must be shaded in the middle of the day, and watered gently once in three days.

In about three weeks, when they have begun to shoot partly from the stalk, and partly from the graft, all the buds upon the stock should be rubbed off as they rise,

the plants must be more frequently watered, and the air admitted to them in the warm part of the day, by raising the glasses.

About the end of May raise the pots half out of the bark: strew some fresh earth upon the surface, and by degrees inure them to the full air. In the middle of June take them quite out of the bark-bed, and set them out among the green-house plants, where they may stand till autumn, when they must be carried back to the green-house. Here let them stand till the beginning of November, and then remove them to the stove.

These plants may also be propagated by layers or cuttings: the former is the surest method, for unless the cuttings are very carefully managed, they will not take root.

The stalks are pliable, and may easily be brought down and laid in pots filled with soft loamy earth, which should be plunged into a hot-bed of tan: if this is done in the spring, and they are carefully watered, the layers will have put out roots by autumn, when they may be cut from the old plants, and each transplanted into a separate small pot, and then plunged into the tan-bed, where they may be shaded from the sun till they have taken new root.

If these plants are propagated by cuttings, they should be planted in April in pots filled with the before-mentioned earth, and plunged into a moderate hot-bed of tanners bark. The pots should be pretty large, and there may be ten or twelve cuttings planted in each; if these pots are closely covered with bell or hand-glasses, to exclude the air, it will greatly promote the plants taking root; they must be shaded from the sun in the heat of the day, and gently refreshed with water when the earth is dry; with this management the cuttings will have taken root by August, when they may be transplanted into separate pots, and treated in the same way as the layers.

These plants will live in a moderate degree of warmth, but if they are plunged in the tan-bed of the bark-stove, they will thrive much better, and produce a greater quantity of flowers; and as the leaves continue all the year, the plants will make a fine appearance in the stove at all seasons.

Persian JASMINE. See SYRINGA.

Scarlet JASMINE. See BIGNONIA.

Red JASMINE, a species of *Plumeria*. See the article PLUMERIA.

ICE PLANT, a species of *Ficoides*, or Fig Marigold.

The root of this is hung with innumerable fibres. The stalks spread themselves every way, leaning upon the ground, and forming, when the root is well nourished, a circle of a very considerable expanse, from four to six feet in diameter. The stalks are thick, round, and full of juice, and every one sends branches off in great number, and with perfect irregularity. The leaves are oblong, thick, juicy, obtuse at the end, undulated, and often raised at the edges; in those plants which flower freely they are smaller: in such as do not, they are three inches long, and two in breadth. The colour of the stalks and leaves is a very fine green, and they are covered thick with shining particles, resembling, according to the different vigour of the plant, and the light wherein it is viewed, spangles of silver, flakes of ice, fragments of crystal, or sparks of diamonds: they are perfectly transparent and colourless, and of uncertain form; these give a glorious lustre to the plant: and there is often, besides this, some variety of colouring, even before it flowers, the places where the leaves are inserted having a tinge of purple, and the tips of many of the leaves being brownish. The flowers are numerous, and of a very singular appearance; they rise from the stalks by very short pedicles, and are in colour white, with a faint tinge of purple: this is principally seen on the extremity of the petals, and on their under side, and it goes off as the flower attains its full maturity; the tinct is best seen on the head of the bud, and here it is usually of a bright purplish crimson. The cup is formed of a single piece, divided by five cuts at the edge. The

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petals, which compose the body of the flower, are innumerable: they stand in several distinct series, and are long, narrow, undulated, and sharp-pointed; and on tracing them to the base, their bottoms are found to coalesce and unite into a kind of ring. In the centre stand numerous filaments, very slender, and crowned with incumbent buttons, and in the midst of them appear five styles: these have their origin from five obtuse angles, which terminate the rudiment of the succeeding fruit, placed below the receptacle of the flower. The fruit is a round capsule with a dent; marked with five rays, and containing numerous roundish seeds.

Culture of the ICE-PLANT.

This plant is a native of Africa, and is propagated by seeds, which must be scattered with care upon some rich garden-mould, laid four inches thick upon a common bed of dung; and let a quarter of an inch of the same mould be sifted over them. As soon as they are put into the ground, let the following compost be made for the plants: mix a barrow of rich meadow-earth, a bushel of pond-mud, and a peck of old cow-dung; add to this a peck and a half of coarse sand, and blending the whole together, throw it up in a heap to the weather. When the plants rise let them be very gently watered; and as soon as it can be seen which are the strongest, let the weaker be pulled up, leaving only as many as are intended to be raised, at due distances: here they may stand, to gather a little more strength, and they must then be removed into separate pots. Let as many small pots be prepared as there are plants; and let an oyster-shell be laid over the hole of each, to keep it open: then let them be filled with the compost, and the plants one by one taken carefully up and set in them. Give them a gentle watering, and set the pots up to the rim in a bark-bed, shading them with mats till they are thoroughly rooted. If there be not a bark-bed in readiness, a common hot-bed of dung will do; but in this case the pots must be removed from one to another, as the heat declines: in the bark-bed it keeps up the whole time, and this is the great advantage bark has over dung. In this bed they are to be watered at times; and as the season grows more mild they may be inured to the air.

In the beginning of July they may be taken out of the bed, and placed among the greenhouse plants: at the time of their being taken from the bed let some be kept for flowering, in the usual way; others planted for spreading and shewing the beauty of their leaves; and others managed for living all the winter. Let the first kind be treated as other green-house plants: then let those which are intended for spreading, be planted in a warm and well sheltered place in the open ground, allowing them a large space to cover, and planting them in some compost thrown into a hole of the bed for that purpose. While those treated in the usual manner flower abundantly, these will attain many times their size, but produce few flowers, or perhaps none. Those plants intended for winter must be taken up, and set in larger pots, shaking off a good quantity of the mould from their roots: they must be watered and shaded till they have taken root; and this should be repeated once in sixteen days. At every time of transplanting, those branches which have flower-buds upon them must be taken off, and by this means the plant will be put backward more and more at every plantation. At the approach of winter they must be taken in the green-house, and transplanted no more: they will then settle themselves for flowering: but it will come on slowly.

JERUSALEM Artichoke. See *Jerusalem ARTICHOKE*.

JERUSALEM Cowslip, a species of Lungwort. See the article *LUNG-WORT*.

JERUSALEM Sage. See the article *SAGE-TREE*.

JESSAMINE, or *JASMINE*. See *JASMINE*.

JEWS Mallow. See *Jews MALLOW*.

INARCHING. See the article *GRAFTING*.

INDIGO, *Anil*, a genus of plants of which there are three species. 1. The Jamaica Wild Indigo. 2. The Guatimal Indigo. 3. The Carolina Wild Indigo.

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Culture of the INDIGO.

The two first species are annual plants, and are propagated by seeds which must be sown on a hot-bed early in the spring, and when the plants are two inches high, they should be transplanted into small pots filled with good fresh earth, and the pots plunged into a hot-bed of tanners bark; as the plants obtain strength, they must have a large share of free air admitted to them, by raising the glasses in the day-time. In June they may be exposed to the open air, by which time they will begin to produce their flowers, which will be succeeded by pods in a short time after, and in August their seeds will be perfected, if the plants are brought forward in the spring.

The third species requires the same method of culture, but this sort will not bear to be exposed wholly to the open air, even in the hottest weather: and if it is preserved in a very warm stove in winter it will last two or three years.

Bastard INDIGO, *Amorpha*, a genus of plants ranged by Linnæus among the *diadelphia detandria*, and of which there is only one species.

This is a shrubby plant, and a native of Carolina. It rises with many irregular stems, to the height of twelve or fourteen feet. The leaves are long and winged. The flowers are produced at the extremities of the same year's shoots, in long slender spikes: they are small and of a deep purple. It is cultivated here as a flowering shrub; but it never ripens seeds in England.

Culture of the Bastard INDIGO.

It may be propagated either by seeds or layers, but the latter is the most common method. In one year these layers will make good roots, and may then be taken off, and planted either in the nursery or the places where they are designed to remain. As these shoots are large and soft, their upper parts are usually killed by frost in the winter, but the spring following they put out new shoots in plenty below the dead part.

The plants must have a sheltered situation otherwise their branches will be broken by the wind.

INGA, a genus of plants which has no English name and only two species. 1. Inga with winged leaves, whose foot-stalks are bordered and jointed, and broad, fleshy, waved pods. 2. Inga with winged leaves, whose foot-stalks are jointed and bordered, and very narrow woolly pods.

The first sort grows naturally on the north-side of the island of Jamaica, and on the Spanish main. This rises with a woody stalk fifteen or sixteen feet high, covered with a white bark, sending out many crooked irregular branches which hang to the ground, garnished with winged leaves, composed of three or four pair of oblong oval lobes, placed opposite on a midrib, which has a border or wing on each side between the lobes, of a lucid green on their upper side. The flowers come out in spikes toward the ends of the branches, each standing in a distinct empalement, divided into five segments at the top, having a great number of very long purple stamina; the flowers are succeeded by long fleshy pods three quarters of an inch broad, filled with a sweet pulp in which the seeds are lodged.

The second sort grows naturally at La Vera Cruz. This seldom rises more than eight or ten feet high, the branches are covered with a brown down, as are the under-side of the leaves; the lobes are not so obtuse as the other sort. The flowers come out of the wings of the branches in small spikes; they are of a purplish colour within, but of a herbaceous colour without, with long long purple stamina, and are succeeded by long, narrow, downy pods, containing several irregular seeds.

Culture of the INGA.

These plants are propagated by seeds, which should be sown early in the spring in pots, and plunged into a hot-bed of tanners bark. When the plants are come two inches high, they should be carefully transplanted into separate pots and plunged into a hot-bed again, being careful to shade them from the sun till they have taken new root; after which they must be treated in the same

same way as other tender exotic plants during the summer. At Michaelmas they must be removed into the tan in the warmest part of the bed. During the winter season they must be kept very warm, and have but little water in cold weather. In the summer they will require to be oftener watered, and in hot weather they should have a large share of fresh air; but they must not be removed out of the stove, for they are too tender to endure the open air of this country, in the warmest part of the year.

INOCULATION, a very curious operation in gardening, otherwise called budding.

It is a kind of grafting practised in the summer months on several kinds of stone fruits, as peaches, nectarines, cherries, plums, apricots, &c. also upon oranges, jasmynes, and various other sorts of plants, which succeed better by this practice, than by the common method of grafting. The operation is performed in the following manner:

Being provided with a sharp knife, with a flat haft, made for this purpose, as also with the cuttings of the tree intended to be propagated, make choice of a smooth part of the stock intended to be inoculated; if designed to be dwarf, five or six inches from the ground: but if a standard, it should be budded at the height of five and a half, or six feet; then, with your knife, make an horizontal cut across the rind of the stock, and from the middle of that cut make a slit downwards about two inches in length, being careful not to cut deeper than the thickness of the bark, lest the stock is wounded; then having the cutting ready, cut off the leaf from the bud, leaving the foot-stalk remaining; cut the bud off lengthways, somewhat longer than the slit in the stock, with part of the wood to it; this done, with your knife slip the wood from the bark with a sudden jerk, and observe whether the eye of the bud is left or not, for those buds which lose their eyes in stripping are useless; then with the handle of the knife gently raise the bark on each side of the slit in the stock, and insert the bud therein, observing to place it smooth between the rind and wood of the stock, cutting off that part of the rind of the bud which may happen to be too long for the slit made in the stock; so having exactly fitted the bud to the stock, tie them closely round with wetted strong bals, taking care not to bind round the eye of the bud, which should be left open. In about three weeks or a month, the buds will require to be loosened of the bandage, which, if not done in time, will be very injurious to them, but not to be entirely divested of the binding, as it is not amiss to tie them slightly again, which will prevent the bark of the stock from flying open, as sometimes happens, whereby the bud is much injured, if not entirely destroyed.

The March following, the stock should be cut off about three inches above the place of inoculation, sloping it the contrary way to the bud; this length is of use to fasten the shoot which proceeds from the bud, which otherwise might be blown out by strong winds: but the autumn following, it should be cut close just above the bud, that the place of amputation may the more readily be barked over.

The time for inoculation, is from the middle of June, to the latter end of August, according to the season and the forwardness of the different sorts of trees intended to be budded, which must be known by trying if the buds will separate from the wood easily. The first sort of fruit commonly inoculated, is the apricot, and the last the orange; although the orange is commonly budded in August, it is very proper to try the operation in July, and those stocks which miscarry may be budded the succeeding month, or even in September; but let it be done when it will, it is proper to place them in a gentle heat, giving them plenty of water, by which means there will be no reason to doubt of their success.

In performing this operation, it will be necessary to take the opportunity of moist cloudy weather, as the bud and stock will more readily unite, being more replete with juices than in hot dry weather, when the stock will perspire so fast, as to leave the buds destitute of moisture.

INULA, a genus of plants ranged by Linnæus among the *syngenesia polygamia superflua*, of which he distinguishes thirteen species, but only the nine following are cultivated in gardens. 1. Inula with oval rough leaves, woolly on their under-side, and the scales of the cup oval, or Elecampane. 2. Inula with hairy indented leaves, those at the bottom oval, but those on the stalks spear-shaped, and embracing the stalk, which have but few flowers. 3. Inula with spear-shaped, recurved, sawed leaves, hairy flowers growing singly, and angular branches. 4. Inula with spear-shaped recurved leaves, which are indented, and rough flowers growing in clusters. 5. Inula with narrow fleshy leaves, ending in three points, called Golden Samphire. 6. Inula with soft, hairy, spear-shaped, entire leaves, and one flower on a stalk. 7. Inula with oblong, entire, rough leaves, and a hairy stalk divided by a corymbus, and flowers growing in clusters. 8. Inula with spear-shaped sawed leaves, embracing the stalk, hairy on their under-side, and an erect branching stalk. 9. Inula with spear-shaped prickly leaves, half embracing the stalk, which is taper, and has but one flower.

These are all perennial plants: for the first species, see the article **ELECAMPAINE**.

The second species is a native of Italy and the south parts of France. The third of many parts of Europe. The fourth sort grows naturally on several mountains in the north of Europe; the fifth on the sea-coast of this country; the sixth is a native of Germany, and the seventh of Hungary. The eighth grows naturally in Austria, Bohemia, and other parts of Europe; it has an annual stalk, as has also the ninth species, which is a native of the south of France. All these species thrive and flower in the open air of this country.

Culture of the INULA.

These plants are propagated by parting of the roots in autumn, which is also the best time for transplanting them. They will require no other culture than to be kept clear from weeds.

They may also be propagated by sowing their seeds in the spring, on a border of light earth, exposed to the east, where the morning sun only is admitted. When the plants appear, they must be kept clean from weeds till they are fit to be removed when they must be transplanted into a shady border six inches asunder. During the summer season they must be often weeded, and in autumn transplanted to the border where they are to remain.

INVOLUCRUM, a kind of cup, which surrounds a number of flowers together, every one of which has besides this general cup, its own particular perianthium. The involucre consists of a multitude of little leaves, disposed in a radiated manner. See the article **CALYX**.

JOB'S TEARS, *Coix*, a genus of plants of which there are only two species. 1. Job's Tears with oval seeds. 2. American Job's Tears with angular seeds.

The first species grows naturally in the islands of the Archipelago. It has a thick fibrous root, from which rise two or three jointed stalks, about two feet high. At each joint are placed the leaves, which are long and narrow resembling those of the reed. At the base of the leaves are situated the flowers in spikes, standing on short foot-stalks; these spikes are composed of male flowers only, and below them are situated one or two female flowers; the male flowers decay soon after they have shed their farina, but the germen of the female flowers swell to a large oval seed, which is smooth, and of a grey colour.

The second species will grow to the height of seven or eight feet, and the stems grow hard like the reed or Indian corn; these branch out and produce several spikes of flowers.

Culture of the JOB'S TEARS.

The seeds of this plant may be procured from Portugal and should be sown on a moderate hot-bed in the spring to bring them forward; and afterwards transplant them on a warm border allowing each two feet room at least, and when they have taken root, they will require

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no farther care but to keep them clean from weeds; they will flower about Midsummer, and in warm seasons the seeds will ripen at Michaelmas.

The second species will not live in the open air of our climate, so should be planted in pots and plunged in the bark-stove, where it will live through the winter, and produce ripe seeds the second year, and may be continued longer if desired.

JOHNSONIA. See the article **CALLICARPA**.

St. JOHN'S BREAD. See **CAROB-TREE**.

St. JOHNSWORT, *Hypericum*, a genus of plants, ranged by Linnæus among the *polyadelphia polyandria*, and of which he distinguishes no less than twenty-two species: but as the greatest part of them are not admitted into gardens, except for the sake of variety, it will be necessary to mention the following only. 1. St. Johnswort, with three styles to the flowers, a stalk with two faces, and obtuse leaves, with pellucid punctures; or common St. Johnswort. 2. St. Johnswort, with three styles to the flowers, and a square, herbaceous stalk, commonly called **Peterswort**. 3. St. Johnswort, with three styles to the flowers, stamina longer than the corolla, and a shrubby stalk. 4. St. Johnswort, with three styles to the flowers, acute cups, stamina shorter than the corolla, and a shrubby stalk. 5. St. Johnswort, with five styles to the flowers, a square, single, herbaceous stalk, and smooth entire leaves. 6. St. Johnswort, with five styles to the flowers, a shrubby stalk, and scarified leaves and branches. 7. St. Johnswort, with three styles to the flowers, a fleshy seed-vessel, and a shrubby stalk, looking two ways, being the common Tatfan, or Park-leaves.

These are all shrubby plants: the first and second species are natives of most parts of England; the third sort grows naturally in Sicily, Spain, and Portugal; the fourth species grows naturally on Mount Olympus; the fifth species is a native of the country round Constantinople; the sixth species grows naturally in the island of Minorca; the seventh sort grows naturally in the woods in several parts of this country, and is therefore seldom admitted into gardens.

Culture of St. JOHNSWORT.

The three first species are propagated by suckers, which are sent out in great plenty, and should be taken off in March, just before they begin to shoot; they should be planted in a light, dry soil, in which they will endure the severest cold of our climate very well.

They may be propagated also by cuttings, which should be planted at the same season, or by seeds sown in August or September, as soon as they are ripe.

The fourth and fifth species are propagated by parting of their roots, because the seeds do not always ripen in this country: the best time for this is in September. The plants should have a dry soil, and a warm situation.

The sixth species is propagated by cuttings, which, in June, should be planted in pots filled with light earth, and plunged into a hot-bed, whose heat is upon the decline, shaded from the sun in the heat of the day, and now and then refreshed with water. In six or seven weeks they will have put out roots, when they should be carefully taken up, and each planted in a separate small pot, placing them in the shade till they have taken new root: they must then be removed to a sheltered situation, where they may remain till the frost comes on, at which time they must be taken into shelter.

This species may also be propagated by seeds, which should be sown in autumn, in the manner directed for the fourth kind, and the plants afterwards treated like those raised from cuttings.

Shrubby St. JOHNSWORT, a species of *Spiræa*. See the article *Spiræa*.

JONQUIL, a species of the Daffodil, or *Narcissus*.

There are three different sorts of Jonquils: viz. the great and small Jonquil, with single flowers, and the common sort, with double flowers, which is most esteemed.

Double JONQUIL. The root is roundish, large, and composed of many coats: the outer skin of a dusky

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brown, and the inner ones white: from the bottom there runs many fibres. The leaves are few, rarely more than three or four, often but two, from a root: and they are long and of a fine green; they are rounded on the back and rusty: brownish towards the bottom, but for the rest of a fine bright green, and hollowed along the inner side. The stalk is round, not very strong, a foot high, and of a pale green, except at the base, where it is often whitish. This rises terminated by a slight scabbard, containing the rudiments of the flowers; when they are perfected for blowing, this thin film bursts on one side, and three or four appear spreading themselves into a kind of elegant nosegay. The flower is throughout yellow, but not without some variety of tinge; the backs of the petals are more dusky, the insides paler, and the middle petals are palest. The light and shade from their accumulated numbers, gives a great deal more apparent variety.

Culture of the Double JONQUIL.

The single Jonquil, from which this beautiful flower is raised, is a native of the warmer parts of Europe.

This plant will live through our winters in a sheltered situation: and the proper soil for it is one of the light rich composts. When the gardener has chose a warm part of the garden, he must dig out the earth of the border a full spade deep, and fill it up with the compost. He must then draw lines at a foot distance one way, and nine inches another: and in the center of each long square made thus, let him plant an off-set from some good root, let him cover this with two inches of the same mould: and after this they will require no more care than to be kept clear from weeds, to be sheltered in the ground in severe winters, by some pease-straw thrown into the bed, and every other year to be taken up and have the earth taken out as at their first planting, and its place supplied with a fresh parcel of the same kind; thus they will continue to flower strong and finely, and will encrease themselves by off-sets.

Yellow and White JONQUIL. The root of this plant is roundish, of the size of a chesnut, and is covered with a brown skin, with many white fibres from the base. The leaves are narrow, long, hollowed, striated, and of a fine fresh green. The stalk is round, upright, of a pale green, and eight inches high: on its top are placed four or five flowers of an odd form, and very elegant colour; they all rise from one common point at the head of the stalk, and each has its separate long foot-stalk: their natural position is drooping, and they are composed of a large nectarium or cup, and six petals rising from its outside toward the base. The cup is of a faint delicate yellow, and the petals are milk white. The colouring of the cup is various in degree and form, usually it is compleatly yellow: and that colour is deeper in some flowers than in others; sometimes the body of it is so pale, that it appears whitish, and the yellow is laid on in streaks: and these will be sometimes continued to the petals, though they are naturally of a pure and perfect white. There is no cup besides the common scabbard, which serves for whole bunches of flowers, and fades soon after it has burst, to give them way. The nectarium is of a bell-like shape, and droops; the petals are narrow and turn up. Within the nectarium rise six filaments, crowned with oblong buttons, which are not seen in the natural position of the flower, because not equal to the nectarium in length; and from the rudiment of the seed-vessel, which is placed under the receptacle of the flower, rises a single style, longer than the filaments, and crowned with a three-parted, hollowed, obtuse head.

Culture of this JONQUIL.

This plant is a native of the southern parts of Europe: it is found wild in moist, warm places, where the soil is deep and rich. The common garden-mould, with an addition of wood-pile earth and rotted cow-dung, will suit it best: about a peck of each of these latter ingredients should be added to a bushel of the other; it requires natural or artificial shade in the heat of the day, and in the flowering season to be often watered. It may be

be propagated by off-sets in the usual manner, but the best way is to raise it from seeds. There will always be produced by that management a great variety of flowers; and if seeds be again saved from the finest of those, the flowers will be improved almost without end or limitation. The method of raising it from seed must be the same with that used for the Narcissus's. See the article NARCISSUS.

IPOMOEA, SCARLET CONVULVULUS, QUAMOCUIT, or AMERICAN JASMINE a genus of plants, ranged by Linnæus among the *pentandria monogynia*. He distinguishes no less than seventeen species of this plant, among which the eight following are most cultivated in gardens. 1. *Ipomoea*, with very narrow, many pointed leaves, and solitary flowers. 2. *Ipomoea*, with heart-shaped, pointed leaves, angular at the base, and many flowers on a stalk. 3. *Ipomoea*, with acute, heart-shaped, entire leaves, and solitary flowers. 4. *Ipomoea*, with heart-shaped, entire leaves, flowers growing in clusters, and undivided petals. 5. *Ipomoea*, with hand-shaped leaves, composed of seven spear-shaped, entire lobes, commonly called Spanish Arbour Vine. 6. *Ipomoea*, with heart-shaped leaves, having three lobes, and three flowers on a foot-stalk. 7. *Ipomoea*, with hand-shaped leaves, and flowers growing in clusters; or Tyger's-foot. 8. *Ipomoea*, with smooth, hand-shaped leaves, whose lobes sit close, and a smooth stalk.

The first species is by some called Indian Pink. It rises with a twining stalk seven or eight feet high. The branches are numerous, and very slender, so twine about any neighbouring support. The leaves are winged, about an inch long, and of a deep green. The flowers are placed at the sides of the stalks, standing upon slender foot-stalks; they are funnel-shaped, having a tube about an inch long, which is narrow at bottom, but gradually widens at the top, and spreads open, flat, with five corners or angles. Their colour is a most beautiful scarlet, and they make a very elegant appearance.

The second species is a native of Carolina and the Bahama Islands. It rises with a twining stalk five or six feet high. The leaves are heart-shaped, ending in acute points, and divided into angles at their base. The flowers appear at the sides of the branches, upon slender foot-stalks, which support three or four flowers of the same shape and size as the former, but not so deep coloured.

There is a variety of this with orange-coloured flowers, but they do not differ in any other respect.

The third species is like the second, but the leaves have no angles, and the flowers are of a rose colour, each foot-stalk supporting one flower.

The fourth species is a native of the West Indies. It has a slender twining stalk, which when near any support, rises to the height of ten or twelve feet. The leaves are heart-shaped and entire. The flowers are blue, and situated at the sides of the branches, upon slender foot-stalks, in clusters.

The fifth species grows naturally in Spain. It rises to a very great height, and sends out many branches. The stalks are covered with a purple bark. The leaves are divided into seven lobes, almost to the bottom. The flowers appear at the sides of the stalks: they are large, funnel-shaped, of a bright yellow colour, and smell very sweet.

This plant is cultivated in most of the islands in the West Indies, to cover arbours for shade: and one of them will cover an arbour of fifty feet long.

The sixth is also a native of the West Indies. It rises with a twining stalk ten or twelve feet high. The leaves are heart-shaped, and divided into three lobes. The foot-stalks rise from the sides of the stalks, each sustaining three purple flowers.

The seventh species grows naturally in the West Indies. It has a twining hairy stalk, which rises four or five feet high. The leaves are hairy, hand-shaped, and divided to the bottom into several lobes. The flowers appear in clusters, inclosed in a five-cornered involucre; they

are of a purplish colour, but small, and open only in the evening, so make no figure.

The eighth species is a native of the West Indies. It has a smooth twining stalk, which rises four or five feet high. The leaves are hand-shaped, having five lobes, and sit close to the stalks. The flowers are situated on the sides of the stalks upon short foot-stalks, which sustain two or three purple flowers.

Culture of the IPOMOEA.

The first and fourth species are propagated by seeds, which must be sown on a hot-bed in the spring. When the plants appear they should be each transplanted into a separate small pot, and plunged into a fresh hot-bed: and sticks must be placed down by each pot for the plants to twine round. After they have taken new root, a great share of air must be admitted to them in warm weather, to prevent their drawing up weak; and when they are advanced too high to remain under the frame, they must be removed into the tan-bed in the stove, where they should have support for their branches, which extend to a considerable distance.

They will begin to flower in June, and there will be a succession of flowers till the end of September. The seeds ripen in autumn.

The second and third species are propagated by seeds, which if sown on a border of light fresh earth in the spring, the plants will come up, and in favourable seasons will flower, and produce good seeds; but the usual and best method of raising these plants, is by sowing the seeds on a gentle hot-bed, and afterwards transplanting them into the borders: in this manner they are brought forward, and perfect their seeds much earlier.

The seeds of the fifth species must be sown upon a hot-bed in the spring, and when the plants come up they must be transplanted into separate pots, and plunged into a fresh hot-bed; but as they will soon grow too tall to stand under a frame, they should be removed into the bark-stove, where they must always remain; and as these plants extend their shoots to a very great height, they require a tall stove, where they may have room to grow, without which they will never produce any flowers.

The plants of the sixth, seventh, and eighth species must be raised from seeds, sown on a hot-bed in the spring, and afterwards planted in separate pots, plunging them into another hot-bed, where they may remain till they reach the glasses, then they should be removed into a glass-case, where they may have room, and be sheltered from the cold, but they should have a large share of free air admitted to them in warm weather.

With this treatment the plants will flower and produce ripe seeds.

IRIS, Flower-de-luce, a genus of plants, ranged by Linnæus among the *triandria monogynia*, and of which he enumerates eighteen species: among these are the *Hermodactylus*, the *Xiphium*, and the *Sisyrinchium* of former authors.

It would be needless to give a particular description of all these species, the more so as some of them are never admitted into gardens: the culture of the ten following sorts will be a sufficient direction to the gardener for that of all the others. 1. Bearded Iris, with the stalk shorter than the leaves, bearing a single flower; or Austrian Dwarf Iris. 2. Round-stalked Iris, with narrow equal leaves, and beardless flowers, with three-cornered rudiments; or Yellow-painted Iris. 3. Beardless Iris, with furrowed, slender, and sharp-pointed leaves, longer than its stalk; or the Persian Iris. 4. Beardless Iris, with hollowed leaves, small to the point, and shorter than the stalk; or Violet Bulbous Iris. 5. Beardless Iris, with the stalk of the length of the radical leaves, and carrying some small leaves, and several flowers; or the Hungarian Iris. 6. Bearded Iris, with one flower, and broad leaves rising above the stalk; or broad-leaved Portugal Iris. 7. Single flowered, bearded Iris, with the stalk longer than the leaves; or Sufian Iris. 8. Bearded Iris, with one flower upon a stalk,

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lower than the leaves; or Peach-bloom Iris. 9. Beardless Iris, with the leaves closing at their edges; or Striped Bulbous Iris. 10. Beardless Iris, with hollowed and pointed leaves shorter than the stalks; or Spanish Bulbous Iris.

Austrian Dwarf IRIS. This plant has a tuberous root, irregular, and whitish: it runs just under the surface, and not unfrequently above it: and is thick, knotty, and of a faint but not unpleasing smell: the taste acrid and nauseous. The leaves are numerous, and of a pale but fine green: they are broad, and they terminate in a point, they are three inches in length, and of a firm substance; in the midst of these rises a single stalk, firm, knotty, flatted, and about two inches high, bearing a single, but large and very conspicuous flower: the leaves exceed the stalk in height, but the flowers rise above them, and the whole plant has a most pleasing aspect. There is no smell, but nature has well atoned for that defect in size and colouring. Naturally the general colour is a blueish purple, paler, and less glowing where the soil does not suit, but in more favourable ground it becomes deep and very rich in tinct; this is the most natural diversity, but it is sometimes white, and the same defect of nourishment which denies colour to the flowers: reducing also their substance they become papery, and though the white wants lustre, delicate and not unpleasing. The last variation seen in the wild plant, is, that the petals are stained with innumerable veins, of a perfect violet, which, when the body of the flower has more of the purple, and less of the blue tinct, gives a pleasing variation. The bearded part at the base of the petals, which is slighter in this than many other species, is of a deep blue: the petals that stand upright will be of a pale, the others of a deep purple, both plain, or both veined. The upper will be flesh colour, veined with purple, or stained with white, the others blue with yellow. The whole flower will be flesh-coloured, stained with a deep purple, in regular and beautiful veins, and this either throughout, or in the upper petals only, the others being painted with a great deal of yellow. The lower petals will be sometimes perfect gold, or veined lightly with a fleshy crimson: the upper ones in various degrees purple. It rises seemingly naked from the summit of the stalk, but at some distance below there is a kind of filmy scabbard, slight and inconsiderable: six petals rise from the flower, and they are truly distinct, though united by their bottoms: they are oblong, large, waved at the edges, obtuse at the ends, and variously disposed: three are placed outward, and these droop, three others stand inward, and they are erect: and at the base of each of the three outer petals there is a bearded line: this is the nectarium of the flower. It is not so conspicuous in this as in some other species, but lies in a manner buried in the hollow of the petals. The filaments are three, they are situated upon the lower petals, and they have oblong depressed buttons. The style is single and very short, but its top or stigma is extremely conspicuous, large, and divided into three expanded segments. The seed-vessel is oblong and pointed, and contains in three cells numerous large seeds.

Culture of this IRIS.

It may be propagated by parting the roots; but the best method is by seeds.

The best soil for it is a rich mould, not too damp, and the fittest exposure, east and a little south. Let a border in such a situation be dug out, and its place filled with the following compost: mix a load of rich meadow-earth with half a load of pond-mud, two bushels of sand, and three of old cow-dung: let these be put together in spring, or it will be better if in the preceding autumn; and while they lie in the heap to mellow with the weather, let seeds be sowed: for this purpose, the gardener must mark two or three flowers; let them be such as are large, deep coloured, with some yellow in the variegations, and with short stalks. Let the roots be refreshed with water while the seed-vessel is enlarging; and let the tops of the leaves be cut off.

When it has the full size, give it no more water; and when the seeds are ripe, and the husk dry, carefully cut it off, and lay it on a shelf to burst at leisure: when the seeds have been spread abroad eight or ten days they will be fit for sowing. Let the compost be thrown into the border, and the surface levelled: scatter on the seeds not too thick, and sift over them a quarter of an inch of the same mould. Throw a few loose bushes over the border: when weeds appear take them up by hand, and again lay on the bushes. In spring watch for the young plants, clear away weeds carefully, and refresh them with gentle waterings. When you can perceive which are the stronger plants, take up the weaker where they grow too thick, and leave the plantation at about five inches distance. All summer keep the bed clear from weeds; and when the mould is too dry gently water it. In autumn sift on half an inch of new mould, and the next spring many of the plants will flower. Mark those which promise best, that is, such as have largest flowers, and those most variegated, and with the strongest colours: leave these in the beds at about a foot distance; and in autumn take up the rest. Plant them out into another border of the same compost, in the same exposure, and with the same distance. They will flower stronger the succeeding year, and it will then be known, which are worth preserving: let the most perfect and beautiful be every year marked for seed; and by a repeated sowing in this manner, the gardener will have endless variety and beauty.

Yellow painted IRIS. The root of this plant is irregular and spreading, blackish, juicy, knobbed, and full of long tough fibres. The leaves are long, narrow, and of a pale green, with some little tinge of greyish. The stalk is round, upright, firm, and not very thick: the leaves on this are few, of a greyish green, pointed at the end, and of a firm substance. The top of the stalk is covered with three, four, or more flowers, which open in succession, and have a great deal of elegance. They consist each of six petals, three of which turn down, and three stand upward. In the state of nature the three petals which turn down are yellow, veined a little with purple, and the three which stand upright much more deeply clouded with that colour: but, in the most perfect and elegant state, the three petals which fall down are of a fine yellow, though not without some tinge of brown, and they are veined with the most glowing violet purple: the three upper ones have the same ground colour, but they are clouded with a more lively purple, in a wild and pleasing irregularity: and there are three other broad parts, resembling smaller petals, in this flower, which, though naturally pale, will receive also from culture various degrees of colouring. In the place of a cup, there are a few vague and light films: the six petals, various in form and disposition, are united at their bases: the filaments are three, and they lie upon the petals, which turn down; and from the rudiment, which stands below the receptacle of the flower, rises a single and very short style, crowned with a vast stigma, divided into three broad parts.

Culture of this IRIS.

This plant is propagated by parting the roots: the time for which is when the leaves begin to change colour, which is usually in August. The pieces should not be too small; and they should be planted in a shady border, at two feet and a half distance, and watered often. The bed must be shaded from the noon-day sun, but open to the east, that it may have its influence in the morning, and the best soil is an equal mixture of rich meadow-earth, and pond-mud.

The Persian IRIS. The root of this plant is of the bulbous kind, but oblong, white, insipid to the taste, and covered with many films, under which its main skins or coats lie. Their juice is acrid; and from the base of this bulb run many thick yellowish fibres, tufted with numerous hairs. The stalk is very short, seldom more than three inches in height, and at the base is covered with several thick whitish membranes; these are continuations of the outer coats of the root; they envelope

velope one another, and open at the points to let out the stalks, and they are ribbed, the ribs faintly stained reddish. With the stalks rise about six leaves from within the covering of the same common membrane: they are longer than the stalk, but not much; they are narrow, hollowed, sharp-pointed, strongly ribbed lengthways, and of a greyish green; they surround the stalk at the base, but within them it is covered with two others, shorter, greener, and more fleshy. The stalk when naked is of a pearly whitish colour; but those leaves which closely cover it are green. The flower stands single at the top, and is large and very beautiful. It has no cup, a few slight films serve that purpose. The shape is singular as well as the colouring; and it is composed of six petals. Of these, three unite themselves into a body and stand erect in the middle; the other three are placed obliquely, they all adhere by their buttons; and they are long, large, and obtuse. The ground tint is a pearly white, stained more or less with blue. The three outermost petals have all along their middle a broad line of yellow, diversified with spots of a lively brown; and on each side run innumerable little lines of violet. The extremity of this golden line stops short of the end of the leaf, and it is there of a finer yellow than elsewhere. At the end is a large spot of the most perfect deep violet purple, with the velvet hue, and this is surrounded with white: the upright petals are more pearly, but they have also their elegant variegations. The filaments are three: they are affixed to the bases of the three outer petals and they are short, but crowned with very long buttons, flatted and furrowed. The style is single and short, it rises from a rudiment of the seed-vessel, placed beneath the receptacle of the flower. The seed-vessel is oblong, marked with three ridges, and filled with numerous large seeds.

Culture of this IRIS.

This elegant species is a native of the east; it is never without beauty, but the culture will add greatly to the variety and lustre of its usual colouring. The plants must for this purpose be raised from seed; and to give them every advantage, the soil, situation, and refreshment of the ground must be attended to with care.

In November mix up the following compost to lie nine months in the air before it is used.

Dig a barrow of mould from under the turf in an upland pasture; mix with it a bushel of earth from under a wood-pile, half a bushel of old cow-dung, a peck of marle, or in its place, a peck and a half of pond-mud, and half a peck of sand. Strew over these a handful of wood-foot, and two ounces of common salt: mix them very well in a heap, and turn it as often as weeds appear. In spring mark three or four of the finest flowers where they blow strong and lively; as they fade, give them once in three days gentle waterings; and now and then stir the surface of the mould. Thus forward the seeds, and when they have attained their full bigness let them stand ten days unwatered to harden. Then cut off the heads, and lay them on a papered shelf in an airy room.

When they have lain to be well dried, open them; shake out the seeds, and scatter them to harden on the same shelf. Then prepare boxes for the sowing them; these must be a yard long, two feet eight inches broad, seven inches deep, and nailed up, of firm but rough boards. Bore five holes at equal distances in each, and cover those with oyster-shells. Then fill the boxes with the compost, and scatter on the seeds pretty thick. Sift over them a quarter of an inch of the same compost, and set them upon bricks, in a place where they may have the morning sun, but be shaded from that of noon. The end of July or beginning of August, will, according to this management, be the time of sowing them. Keep the mould clear from weeds, refresh it at times with a little water, and in the beginning of October remove the boxes into a place defended from all cold, and open to the noon sun; and let a mat be hung from the wall, that may in bad weather be let down over them.

Early in spring the plants will appear. Let the weakest be taken up where they rise too thick; let the mould be kept clear from weeds, and refreshed now and then with water; and at the end of April let them be removed into their first place. In July the leaves will be decayed: let a quarter of an inch of fresh compost be sifted over them; and let them in October be removed again into their winter situation. The compost from which the filling of the boxes was taken must remain open to the air, turned at times and kept clear from weeds.

The next year, in July, when the leaves of the young plants are decayed, a border must be prepared for their roots. Chuse a warm sheltered place, rake out the mould, and throw in two thirds of the compost: lay the surface level, and draw lines lengthways and across, at four inches and a half distance; mark an opening in the centre of each little square, and then separate the roots from the mould in the boxes, picking them out by hand, not sifting the mould as may be done in some cases.

Set one root in the centre of each square upright and steady; and when all are placed, sift over them some of the remaining compost; let them be covered two inches above the top, and leave them thus to nature. Weeding and watering are all they require further. The remaining compost must be saved to sift over them, a quarter of an inch at a time, in autumn, to defend them from frost, and in spring before their shooting. The third year they will flower, and there will be found a great variety: the finest must be marked, and when they have flowered three seasons, seeds must be saved from them and sown in the same manner. The first crop will exceed the common flowers of this kind; but the produce of the best among these will be extremely beautiful.

Once in three years the roots should be taken up, but they must soon be planted, for they are spoiled by the air. This taking up is for removing the off-sets, and refreshing the bed with new compost, and that should be made as the first.

Violet Bulbous IRIS. The root of this Iris is roundish, large, fleshy, and covered with several dark membranes. The leaves are hollowed, oblong, pointed, and of a fine green, but often irregularly spotted on the inside. The stalk is juicy, low, surrounded with a few leaves and membranes, and naturally supports only one flower.

Sometimes from the luxuriance of culture two or three will burst out in succession; but they are not so fine as when the effort of nature is for one, and all the juices are sent to its nourishment. This is large, and of a deep and elegant violet blue, variegated with no other colour, except a mark of yellow toward the extremities of the three lower petals: the whole flower consists of six; three are placed outward, and hang downward; three inward, and stand erect. The bases of the three lower are in many of the kinds marked in a particular manner by a hairy nectarium, these are called bearded flowers. In the place of those beards there are in this on each of the petals three dots, which serve the same purpose, though without the ornaments; and the flowers are therefore called beardless.

Culture of this IRIS.

The root freely produces off-sets; by these it is easily propagated. It is a native of Spain, and therefore requires, though not a stove or green-house, yet the warmest part of our common garden ground; and this must not be too much open to the sun. If the gardener's care proceeds no farther than to the increasing it by off-sets, let him allow these in such a part of the ground a proper compost, and not bring them thither till they have stood one season in a nursery bed; after being separated from the old roots, for the first year they blow weakly.

The compost must be made thus: mix equal parts of meadow-earth and pond-mud, and add about one fourth rotted cow-dung; this will be a rich, and yet cool mixture, which the plant loves. If he use off-sets, let them be brought in from the nursery soon after their leaves are decayed, and planted at eight inches distance. Every
year

year after flowering let them be taken up, cleaned, and immediately planted again in fresh compost of the same kind; and their off-sets separated and raised as before directed. For the raising them from seed let a bed be prepared in the nursery well sheltered from winds, and from the noon-sun, and on this filled with the compost just directed, let the seeds sowed from a thriving and well flowering plant be sown in the last week of August. They must be scattered equally over the surface, and a fingers breadth of the same mould sifted over them. Lay a piece of hawthorn on the bed, and keep it clear from weeds; when the earth dries allow a little water; but this must be given with great care not to wash the seeds out of the ground. If the bed lays open on any part to cold winds, plant a reed-hedge to screen it in winter; and in hard frosts draw a mat over the bush; and thus they will rise according to their nature early in the spring. If they rise too close they must be thinned. Let all weeds be cleared off as soon as they appear, and let them be allowed moderate waterings.

In June the young leaves will fade: clip them off, and sift on half an inch of mould, thus let them lie the winter. Next spring treat them as before, but in the end of June when their leaves decay, take them up; let a large bed of the compost be prepared in the same or some like part of the nursery: sift the mould of the seed-bed to get the roots, and plant them regularly as soon as separated in the new bed, at four inches distance: defend them in severe frosts, weed them in spring, water them as there shall be occasion, and thus raise them to flower. Mark the finest: and when the leaves wither, take up the roots of those and plant them at a foot asunder, in such a bed as is directed for the off-sets in the flower-garden: after this treat them as the roots raised from off-sets, encreasing them the same way. The next years flowering in the nursery bed will shew which of the others are worthy to be mixed with these, and they should be brought in when the leaves wither, the garden-bed being enlarged to receive them. The rest may be planted in common places to give variety.

Hungarian IRIS. The root of this plant is thick, irregular, knotty, and yellowish. The leaves are numerous, long, broad, sharp at the point and edges, and of a fresh but somewhat blueish green. The stalk is round, of a pale green, upright, but with some little bendings, and a foot and a half high: toward the ground it is often purplish, as are also the leaves, which rise with it from the root. There stand on this in an irregular manner, two, three, or four slight leaves, much smaller than those from the root, and paler.

The flowers are large and very beautiful, one usually terminates the stalk: and there burst forth others without any regularity, sideways, a little below it: these are formed as those of the Bulbous Iris just described; they have no cup: three petals stand upright, three droop, and there are three broad and leafy tops to the head of the style, which represent so many other smaller. The colouring is extremely various and uncertain, but always elegant. The three upright petals are of a fine gold yellow, naturally plain and elegant, only in the purity of the tinct, but sometimes veined with a deeper hue: the three petals which hang down are white, variegated with streaks, and of purple or crimson. The bearded part at the base is yellow toward the bottom, and whitish toward the end; and the three heads of the style are also variegated with yellow and white; this is the usual colouring, but in different flowers it varies extremely. In some the three under petals are altogether white, in others they are flesh coloured, and in others they are crimson at the base, from whence all the rays proceed, which run in a regular direction to the tip, of the same colour.

Culture of this Iris.

The common method of propagating this, is, as in the other, by the root; as that of the Bulbous Iris produces off-sets, this spreads out every way in thick irregular parts, and will bear to be every year or two, divided, and the separated parts will flower, if not too

small, the first year. It is a native of Spain, and loves a light rich soil, with some moisture: and though it flourishes in a warm air, it does best where there is least sun: therefore let a part of the garden suited to this be chosen, and let the compost be pasture-earth and pond-mud, each a bushel: wood-pile earth and cow-dung, of each half a bushel, and a peck of sand: let these be mixed in spring, and in the first week of September thrown into the place selected for the plant; let the roots be taken up and parted in a cloudy day, when there is a probability of showers, and immediately planted at two feet distance in this bed. If there fall no showers, they must have gentle waterings, and they will flower unless too small, the next year. The way to raise the plant in its highest perfection, and to procure flowers of more than ordinary beauty, is to sow the seeds. These should be gathered from a handsome plant, and sown in a nursery bed of the same compost, managing them as the former kind; and when they come to flower, selecting the finest and planting them in such a bed in the flower-garden; among these fine flowers that will shew a great and elegant variety of colouring, let the best be marked for seed again, and that sown with the same precaution. In this manner will be obtained the finest flowers the plant is capable of producing, and these are then to be managed with the same kind of care directed for the parted roots.

The place in the garden must be shaded, for the full sun destroys their flowers in a few days, which naturally are much more lasting: there must be water allowed them frequently, from the first shoot of the stalk till the time of their flowering is past. When they are in bloom they should be sheltered by a reed-hedge, if the place be open to any sharp wind: and the first flowers must be cut off as they grow towards fading, that the others may open in full perfection, and unless seed be wanted let none stand to ripen any. When seed is required, let only the first flowers be permitted to ripen: for the others would exhaust the nourishment, and the seeds would be less perfect; let these be dried, and sown in the same manner, and at the same season with those of the other kind. For the management of the root nothing more is required than the allowing them fresh compost every year: this must be done in August; when the flower-stalks are quite faded, and the leaves look pale, they must be immediately planted again: for the intention of this is to prevent their spreading to so large a bulk as to rob one another of the due nourishment.

Broad-leaved Portugal IRIS. The root of this Iris is thick, tuberous, long, and white: it spreads under the surface, and is of an acrid taste. The leaves are numerous, broad, and short: they rise many together, and are of a deep but somewhat blueish green, of a firm substance, and marked with three or four longitudinal ribs. The stalk rises in the midst of these, and is about two inches high: roundish, irregular, knotted, and covered in part with some slight membranes. On its top stands one beautiful and very conspicuous flower: its natural colour is a fine violet blue, but sometimes it is variegated with yellow, in various degrees and forms, and often with great elegance. There is no cup to the flower, and it is formed as in the others of six petals, three of which stand erect, and three turn back; these are all united at their bases, and in the centre rises a short style, crowned at its top with three leafy divisions, which hang in a wild manner, and resemble three additional petals; this is common to the rest of the Iris's.

Culture of this Iris.

The seeds for propagating this Iris should be sowed from a strong and vigorous plant in the following manner: while it is in flower let the ground be cleared about it, and frequently dug up with a trowel at a proper distance. The stalk must be tied up to a short stick, and it must have frequent and gentle waterings. When the seed-vessel has been thus brought to its full bigness, desist from watering, and let it harden in the air; cut it off when hard, and lay it in an airy room on a shelf: break it when it has lain there a week, then let the separated

rated seeds lie a fortnight to harden, and prepare for sowing them.

The proper compost for this Iris is made as follows: let the gardener mix a bushel of garden-mould, with the same quantity of earth from under a wood-pile, and three pecks of cow-dung, with a quart of sand, two quarts of soot, and two ounces of sea-salt: let this lie six months exposed to the air in a heap, turning it often, and then add to it a peck of lime fresh made: let it be well wrought together, and frequently turned, and thus let it lie half a year longer. The best time to make the first mixture is in autumn, then in the spring the lime may be added, and in the autumn following the compost will be fit for the reception of the seeds.

Chuse two or three broad, and not very deep earthen pans. Cover the bottoms with chips of free-stone, having first bored two holes in each, to let out the water. Then pour in as much of the compost as will lie four inches thick. Scatter the seeds over this with an even hand, and let them lie at one inch distance or thereabout. Sift over them half an inch of the same compost, and then give a light and gentle watering.

Set these plants in a place where they may have the morning sun; and from time to time examine the mould that it do not grow too dry. Give waterings when required, but always very moderate. In October set the plants in a place where they may have the full noon-sun and thus let them stand through the winter. In April they must be removed to their former place; and from this time they must be managed as we have directed for the seedling flowers. These plants must be thinned where they rise too close; and when the young leaves fade there must be a quarter of an inch of mould sifted over them. Weeds must be kept off, and moss; and such waterings must be allowed as will give them full power of vegetation. When they are strong enough to be transplanted for the first time, a bed must be made for the generality of them, of the same compost, with chips of stone in the same manner thrown underneath; and a few of the choicest of them must be planted out into separate pots. These pots should be small; there must be several chips of stone in the same manner thrown into them, and the mould over these, the roots must be planted at a very small depth; half an inch is the full covering they should be allowed at first. Let the plants in the bed be weeded and watered, and these in the pots exposed to the morning sun, but never to that of noon. In autumn let a little mould be sifted over them, for they will require to be more covered in winter than summer; and thus let them be brought to flower. There will be found many with variegated flowers both in the beds and in the pots; but those in the pots will be the finest; and there is a fair chance though not a certainty, that some of these will have striped leaves.

When a plant of the variegated kind is found, it is to be treated only as the other favourite flowers of this sowing; every one of which should be taken out of the ground, and planted in a small pot. Stones should be laid in not only under the mould, but mixed among it to prevent the spreading of the roots; and thus the plant will be kept in its natural condition of growing.

Every summer when the flowering is over, and the leaves are faded, the roots must be taken up and parted. The partings may be planted in the borders. The roots preserved in the pots must never be suffered to grow too large, and every time they are taken up fresh compost must be used.

Striped Bulbous IRIS. This is an Iris that very well deserves its place in the best gardens: it is inferior to none in beauty, and hardy enough to bear all seasons. The root is bulbous, small, white, and enclosed in several membranes. The leaves rise five or six together; they are of a fresh green, long, narrow, hollowed, and sharp-pointed. The stalk is round, thick, jointed, and surrounded by several strait leaves, of a paler green than those from the root; it is a foot and a half high, and supports, when in its greatest perfection, only one flower; sometimes there will be two or three, but they

are always inferior to such as are supported singly on their stalks, and of less duration; the gardener should therefore pull off the second flower as soon as they appear in the bud, that the whole effort of nature may go to the support of the one principal flower.

This Iris has no cup, except some light irregular films, which form a kind of scabbard can be called by that name. The petals are six, three placed upright, and three drooping; and there is the appearance of another set of three, but these are only the broad appendages of the style. All the six petals unite at their base; and from their centre spring three filaments, these lie upon the drooping petals, and have thin, oblong, strait, depressed buttons.

The ground colour of the flower is a pure pearly white. Each of the drooping petals has a singular oblong mark, of a lemon yellow in its middle, and these as well as the upright ones are streaked with a celestial blue in the most regular and elegant manner; these streaks are in some flowers broad, and in others narrow; they are also of a deeper colour in some than in others. The yellow is subject also to some variation, but it is most agreeable when of a pale and delicate hue.

Culture of this IRIS.

A large quantity of the seed of this Iris should be sowed together, which must be saved from strong plants, and such as have ripened only one flower; this should be sown just when it is thoroughly hardened; and when the plants come up, they must be treated in the manner directed for the bulbous Iris's.

Sufian IRIS. The root is tuberous, thick, irregular, and juicy. The leaves are long, moderately broad, and of a fresh green. They rise six or eight together, and surround one another at the base; they are sharp at the points and edges, and of a tolerably firm substance. The stalk is a foot and a half high, round, thick, jointed, and of a pale green; and it supports a single flower, the largest of all the Iris kind; and when nearly viewed one of the most elegant. It is composed, as those of the other Iris's, of six petals, among which appear the three leafy heads of the style, so much resembling three others, that the flower has been usually understood to be composed of nine. Of the six proper petals three turn down, and three stand upward. The three lower petals are black on their inside, only there run some violet purple lines along these from the base to the middle; and spread themselves, though less distinctly, through the rest. The middle of the petal toward the base is black and hairy; and in the centre there is a delicate jetty spot, of a velvet appearance. The outside of these petals is of the same blackish hue, but fainter, often tinged with a dusky purple, and often degenerating into an ash grey. The three petals which stand upright are waved and curled, and they are large but thin. They are of a dusky lead colour; variegated from the base to the tops and edges, with fine small lines of black and greyish; and there are usually intermixed among them some small dusky spots. The three leafy heads of the style, are divided at their tops, and are of a faint purplish tinge, with a great deal of the same black hue and the whole flower at a distance resembles the feathers of some Indian birds.

Culture of this IRIS.

This plant is easily increased by parting the roots in autumn, but the best method of raising it is from seed.

The proper compost for them is a mixture of equal parts of garden-mould, and rich black earth from under the turf in a meadow. Let some seeds be saved from a very strong plant, which has stood under a warm wall. Let them be dried in the usual manner, and a bed prepared in a sheltered part of the seminary with the compost just directed. The spot must be defended from the noon, and open to the morning sun. On this bed let the seeds be scattered with an even hand in the latter end of August, and covered with a quarter of an inch of the same mould. When the young plants appear, they must be weeded and gently watered, and in the end of September

ber they should be taken up, and planted in another bed at eight inches distance. Here they may stand till the September following, and then it will be time to remove them into the flower-garden, for they will flower the next year. A place must be chosen for them under a warm wall, open to the east and sheltered from the noon-sun. A bed must be made for them of the above compost, and they must be planted at eighteen inches distance. They must be carefully weeded and watered, and the succeeding summer they will flower.

Let the first be marked while in bloom; and in the September following let the roots be all taken up, and a new compost thrown into the place. The inferior kinds may be planted out in the borders of the garden; and these finer kinds kept together, in their former place though in a new soil. When they have been nursed in this manner two or three years, they may be increased by parting the roots when taken up in autumn for renewing the soil; and at the same time seeds should be saved from one or more of the very finest flowers, and a new stock raised.

The old plants are then to be removed into the common borders, as soon as the new seedlings come to the state of perfect flowering; but the same place preserved for the choicer kinds.

Peach bloom IRIS. This is a very low, but showy plant. The root is tuberous, thick, spreading, and whitish. The leaves are numerous, and of a very delicate green; broad, short, obtuse, and highly ribbed. The stalk is very short, thick, ribbed, and irregular. The flower stands on its summit, and is very large. It is composed as those of the other Iris's, of six petals, and three leafy appendages to the style; and is of a very fine pale crimson. The petals are firm, and the whole flower is permanent, and of a very fine violet scent. Three of the petals hang more or less downward, and the others stand upright, and close in upon one another. Toward the base of the lower petals is placed a long and large bearded nectarium, and above these stand the three long heads of the style. The natural and proper colouring of the flower is throughout a pale red. The three petals which fall downwards are the palest: the three which stand up have more crimson; and the three heads of the style are of a fainter colour than these, but have the same kind of tinge. This is the proper colouring of the petals: the bearded nectarium is thick, and of a violet blue, and near it there is on each of the lower petals a yellow spot.

Culture of this IRIS.

The best method of cultivating this plant, is in the manner of the former Iris's, only to give it very little water, and to mix a peck of dry sand with every bushel of the compost. The method is to sow a large quantity of seed, and among the plants which rise there will always be a variety of colouring: from these the palest are to be preserved for seed, and that sown again. When the plants raised from this are of a bigness to be brought into the garden, a bed must be prepared for them in the same place where they may have a great deal of sun, but not that of the full noon-day: and the compost being thus lightened by a mixture of sand, they must be planted at a very slight depth, and the stirring of the ground about them, must in general, serve instead of watering. The dews will be thus detained in the mould, and they are the proper refreshment of this delicate flower. But if the soil at any time becomes so dry that it visibly declines, a little water must be allowed.

Spanish Bulbous IRIS. The root of this Iris is considerable in proportion to the plant, and in comparison to the other kinds: it is whitish and hung with fibres. The leaves are few but long: they are of a fine fresh green, sharp-pointed, hollowed, and of a firm substance. The stalk is two feet high, slender, of a pale green colour, and not at all branched. The leaves on it are oblong, narrow, and sharp-pointed: they are naturally of a paler green than those from the root, but often becomes reddish, especially the lower ones. One flower

terminates the stalk, which is extremely delicate: it consists as the other Iris's, of six petals, three of which turn downward, three stand up, and is furnished also with three leafy heads to the style. The universal colour is a pale fleshy red. The three upper petals are pale; the three lower deeper, and each marked with a yellow spot toward the end: sometimes also these lower petals are streaked with white.

Culture of this IRIS.

This Iris is propagated by seeds, in the manner of the rest, with this difference only, that it requires a somewhat poorer compost, which will always preserve it in its natural delicacy.

IRON-WOOD, *Sederoxylum*, a genus of plants, of which there are two species. 1. Smooth Iron-wood. 2. Iron-wood, with spear-shaped leaves growing opposite. These plants grow naturally at the Cape of Good Hope. The first species has large oval leaves, in shape resembling those of the Bay-tree, but smoother and blunter at the end. These are placed on the branches without order, as the branches also are produced. The stalks are shrubby, and rise five or six feet high, sending out many branches, covered with a dark brown bark.

The second sort grows more upright and regular; the leaves, which are smaller and more pointed than those of the first, are placed opposite on the branches, and those continue green all the year.

Culture of the IRON-WOOD.

These plants are natives of warm countries, and to preserve them here they must be placed in a warm stove.

They are propagated by seeds, which must be sown in pots, and plunged into a good hot-bed in the spring, in order to get the plants forward early in the season.

When the plants are fit to remove, they should be each transplanted into a separate small pot, and plunged into a fresh hot-bed. In winter they must be placed in the tan-bed in the stove, and treated like other tender exotics. As the plants obtain strength, they may be treated more hardily, by placing them in a dry airy glass-case in the winter, giving them free air in mild weather, but in summer they should be placed abroad in a sheltered situation.

IRONWORT, *Sidentis*, a genus of plants, of which there are nine species: these are preserved in botanic gardens for the sake of variety, but there is only one of them propagated in other gardens: viz. Shrubby, Woolly Ironwort, with heart-shaped leaves.

This plant grows naturally in the Canary Islands. It rises with a soft shrubby stalk, five or six feet high, sending out ligneous branches covered with a soft down. The leaves are heart-shaped, and have long foot-stalks. These differ greatly in size, according to the age and vigour of the plants; they are very woolly, especially on their under side, which is white, but their upper part is of a dark yellowish green. The flowers grow in thick whorled spikes, at the ends of the branches; their colour is a dingy white.

Culture of the IRONWORT.

This plant is propagated by seeds, which should be sown in autumn: for those which are sown in the spring seldom succeed, or if they do the plants rarely come up the first year. In winter they must be screened from hard frosts under a common frame, and in mild weather they may be exposed to the open air.

ISOPYRUM, a genus of plants, of which there is no English name, and only three species. 1. Isopyrum, with awl-shaped stipulæ, and acute petals. 2. Isopyrum, with oval stipulæ, and obtuse petals. 3. Isopyrum, with obsolete stipulæ.

The first species is a native of Siberia, and an annual plant. The second and third grow naturally about Verona, and are biennials.

Culture of the ISOPYRUM.

These plants are propagated by seeds, which should be sown in a shady border soon after they are ripe; or if the seeds are permitted to scatter, the plants will come up, and require no other care than to be kept clean from weeds.

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There is no great beauty in these plants, so that a small patch or two of them in any shady part of the garden, by way of variety, will be sufficient.

ITEA, a genus of plants, which has no English name, and of which there is only one species.

This shrub grows in several parts of North America, where it rises to the height of eight or ten feet, sending out many branches from the ground upward. The leaves are spear-shaped, slightly sawed on their edges, placed alternately, and of a light green. At the extremities of the same year's shoots are produced beautiful spikes of white flowers, three or four inches long, standing erect. When these shrubs are in vigour, they will be entirely covered with these spikes of flowers, so that they make an elegant appearance at their season of flowering, which is in July.

Culture of the ITEA.

This shrub thrives very well in the open air of this climate. It is propagated by layers, which should be the young shoots of the same year, for the old branches do not put out roots kindly. The shoots should be laid down in autumn, and they will take root in one year.

JUDAS-TREE, *Cercis*, a genus of plants, ranged by Linnæus among the *decandria monogynia*, and of which there are only two species. 1. Judas-tree, with smooth rounded leaves, heart-shaped at the base. 2. Judas-tree, with downy heart-shaped leaves.

The root of the first species spreads far: the trunk, which rises to the height of twelve or fourteen feet, is covered with a deep brown bark, and the young twigs are purplish. The branches are not numerous, nor do the leaves stand thick upon them. Each leaf has a foot-stalk, which is purplish. The form of the leaf is nearly round, indented a little for the reception of the foot-stalk, and at the opposite parts terminated often by a kind of point. The colour of the leaves is a deep green, with a tinge of blue: and the veins and ribs in the new leaves are red. The flowers appear early in the spring; they rise on divided foot-stalks from every part of the branches, and many times from the stem in clusters. Their colour is a beautiful bright purple, which makes an elegant appearance, especially when the branches are covered thick with the flowers, for they come out in the spring with the leaves, and are in full beauty before the leaves have obtained half their size. It is a native of the south of France, of Spain, and of Italy.

The second species grows naturally in most parts of North America, where it rises to a middling stature, but with us it seldom attains any great height, but branches out near the root. The branches of this are weaker than those of the first sort. The leaves are downy, and terminate in points. The flowers are small, and do not make so elegant an appearance as those of the first.

Culture of the JUDAS-TREE.

Both these species are propagated by seeds, which should be sown about the middle of March in the seminary, upon a piece of ground where the soil is light and not too rich. Upon this bed the seeds must be scattered thinly, with an even hand, and half an inch of the same mould, sifted carefully over them, and once in three days they must be gently watered, if no rain falls; but if the season proves wet, it will be proper to cover the bed with mats to preserve the seeds from it. Some few of the plants will rise the first year, but a greater number the second; for this reason the ground should not be disturbed, till it appears that all the plants are come up: a number of weeds will rise with them, which must be cleared away: and as soon as it can be seen which are the stoutest plants, let them be thinned by taking up the weaker. When they are thus reduced to a proper distance, they must have water once in two or three days in summer, and the mould must be frequently and well stirred and broken between them. In winter some hoops must be placed over the bed, and a mat drawn over it in sharp weather. This must never be suffered to remain over the bed longer than there is occasion; and toward the end of winter it must be used most sparingly, that the plants may bear the free air of spring uninjured.

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In the last week of the succeeding March, let a piece of fresh earth be dug up, and well broke in another part of the nursery: then remove the young plants very carefully out of their seed-bed, and set them immediately in the new soil at two feet and a half distance. Close by each plant thrust in a strong stake, that as the stem rises it may be tied up, to secure its growing straight. When the plants are all in, and the stakes fixed, bring them gently to their supports with a piece of bair, and give the whole bed a gentle watering: this must be repeated twice a week in dry weather. At the approach of winter there must be some pease-straw strown over the ground, to defend them from frosts, and the shoot must be again tied up as it rises. In the February following let the earth carefully be dug between them, and at the same time let the side-shoots that grow too low be taken off, and the head left entire. This must be repeated the succeeding year; and the next after that, they may be transplanted into the places where they are to remain.

JUJUBE-TREE, *Ziziphus*, according to Linnæus, a species of the *Rhamnus*, but by other authors considered as a distinct genus.

There are several sorts of this tree, which grow naturally in the warmest parts of Europe, and in Africa and India.

Culture of the JUJUBE-TREE.

The several sorts of this tree are propagated by planting their young shoots in pots of light earth, soon after the fruit is ripe. In winter the pots must be placed under a common hot-bed frame, and in spring plunged into a moderate hot-bed.

When the young plants are come up, they should be inured to the open air by degrees, and in June they may be placed under the shelter of a warm hedge, where they may remain till the latter end of September, and then they must be removed into the green-house, or else set under a hot-bed frame. During the winter they must have as much free air as the season will permit, and be watered at times, but this must be done with the greatest caution, after they have shed their leaves. In the March following, before they begin to shoot, they are to be transplanted, each into a separate pot of light earth, and they should then be plunged into a moderate hot-bed, and watered and shaded till they have taken thorough root, and in May they are to be removed thence into the open air. They must be housed in winter till they are about four years old, and then may be transplanted into the naked ground, and will stand our winters.

JULUS, or **CATKIN**. See **CATKIN**.

JULY, the seventh month in the year.

In the flower-garden all weeds must be taken up at their first appearance, and the surface of the borders should often be broken, and raked clean and smooth. Observe on these occasions to draw up a little mould about the bottoms of those plants, which are coming into flower; the gravel-walks must be kept constantly rolled, and the grass frequently mowed. Open the beds in which the spring-flowers blowed, whose leaves and stalks are faded; take up such as are to be planted again immediately: give a fresh soil, or dig up the old thoroughly.

Those roots, which are to be kept out of the ground till autumn, must be cleaned, spread upon a mat, and turned till they are hardened. The others must be cleared, their off-sets taken away, and the ground being made up, they must be planted again as at first. Great care must be taken of the layers of Carnations, Pinks, Sweet-williams, and other flowering plants. The plants coming into flower must be watered freely. Take particular care of those plants intended for seed: and as the heads or pods harden cut them off, and lay them upon a proper shelf to dry; and where there are many kinds, divide every shelf by ledges of the same paper, into several partitions. The biennials sown late in the spring, will require transplanting about the end of this month. Look over all those summer plants which produce a great many flowers: to continue these in succession, they must be prevented from ripening of seeds. Keep a watchful eye upon the cuttings of exotic plants: they will require watering and shading, but both in moderation. All transplanting about this time of year, must

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must be done in the evening about sun-set, the waterings will take more effect, if given an hour or two before.

In the *Seminary*, the beds of seedlings will now be scorched up by the sun, unless shaded by reed hedges, or some other shade at noon; and the earth will be so dried up, as to require frequent waterings both in these beds, and wherever else there are new planted trees or shrubs, not sufficiently established. Continue inoculating the several kinds of Peaches, Nectarines, and Cherries, in succession, according to their seasons. In this part of the ground, the growth of the weeds will require continued and repeated care, and particularly among seedlings.

Inoculate Plums and Pears in this month. Look over those which were inoculated first; and loosen the bandages a little, to give a free course to the sap. The seedlings not yet removed out of their first beds, will require also shading from the extreme heat of the sun. Observe to go round the ground where those stand, that are of a more advanced growth; and with a knife reduce them to order. Evergreens require the same care. Layers which were in the ground last month, will now require great care: keep them securely in their places, and repeat the waterings.

Weed and water young exotic trees particularly those of the resinous kinds, which were planted out of their seed-beds some weeks before. Transplant evergreens about the end of this month. Let the whole ground be cleared from weeds, and the young plantations watered.

In the *Fruit-garden* the same care is required of those fruit-trees which have been newly planted in the garden or orchard, as of those in the seminary. After their transplantations, look to their fastenings, whether by nailing to walls, or by tying up to poles. If they rock at the roots they will perish. Let them be tied or nailed up more securely; let the mould be broke about them, and closed at the bottom of the stem, and they must have frequent waterings. If these do not give perfect vigour, let a little dung be added to the mould and marshed in by repeated and large waterings. Care must now be taken of the standard-vines. The free passage of the air between, and among fruit-trees, is an essential article towards their obtaining their true flavour; break up the surface of the mould in the fruit-tree borders, with the three-pronged fork; but it should be done lightly and superficially. As soon as this is done, allow a gentle watering, and let this be given at a distance from the stem. Insects are now abundant upon fruit trees.

Phials of syrup are to be hung upon the trees, but these are only baits for flies and wasps. The caterpillar, which preys upon the leaves, is a more terrible enemy. The most mischievous are the single green kind; they are small but they devour immoderately. When they are situated at the end of a branch, there appears a round lump in the place. This discovers them, but if let alone a very little time, they eat off the part where they are thus concealed; and this not only hurts the present fruit, but destroys the branches for the succeeding year.

From the trees beginning to bud, to the fruits ripening, they should be sought after, upon the ends of the young shoots; afterwards upon and among the blossoms, which they often fasten together by a kind of web; and at last among the fruit, or upon the back of the leaves. If any fruit-trees against the walls are not of the desired kind, they should be inoculated upon the tender shoots. Let the gardener look over the trees at noon, for the destruction of wasps and flies; and in the morning and evening, for that of the snail, slug, and other creeping insects.

In the *Kitchen-garden*, about the beginning of this month, plant the late crop of French-beans, in a part of the ground open to the noon-sun, and defended from the east and north. Weeding and watering must be continued at this time throughout all the kitchen-ground.

J U N

Endive and Celery that have been planted out for blanching, must be constantly and regularly supplied with water. The Lettuces require the same refreshment; and for both these crops great care is required to protect them from the slugs or naked snails; these must be destroyed every morning and evening, and after showers. Clear the ground where those crops have stood, which are now gathered off; and prepare it for such others as are fit for transplanting. Always let a few days be allowed between the clearing off the remains of an old crop, and planting a new one. Water the various growths.

The kitchen-garden which has been properly managed, abounds at this time with crops of seedlings, and others that have been transplanted into their second or third beds. The success of all these depends, in a great measure, upon moisture: where weeds have risen, they must be again carefully destroyed, especially among the transplanted crops.

This is the time for sowing the turnep-rooted radish. Onions, intended for winter use, will be fit for taking out of the ground. A piece of ground cleared of these will, with a little refreshment, perfectly suit the radishes; and the two works may be done in a proper succession. About the end of this month dig a piece of ground and sow Colewort-seeds for the succeeding spring. Dig another piece for transplanting of Brocoli. Particular care should be taken at this time of the Melons.

In the *Green-house*, the new raised plants will by the beginning of this month, require to be removed into large pots: these new pots must continue in their shaded situation, till the plants are perfectly rooted, and have recovered the check from the removal. They must then be brought to the place where the other green-house plants are set out for the summer. Take off cuttings from the Euphorbiums, Mesembryanthemums, and other succulent plants for propagating them. Lay these upon a shelf in an airy room, and turn them for several days. Look over the Orange-trees.

In the *Stove* the degree of heat must be very well regulated by the thermometer, and the bark-bed where it is found necessary refreshed. The generality of plants in the stove will at this time require as much free air as can be conveniently admitted: and those which are most exposed will be scorched, unless the glasses be shaded in the middle of hot days. Pine-Apple plants will at this time require great care; the fruit will be ripening fast upon them. The plants from which this fruit is cut will readily produce suckers, and those which come earliest are vastly the best, for they will be got off before winter.

JULY-FLOWER, Carnation. See the article **CARNATION**.

JUNE, the sixth month of the year.

In the *Flower-garden*, get into the open ground, about the beginning of this month, the remainder of the annuals raised in hot-beds. The beginning of this month is also a proper time for propagating the common green-house plants, by cuttings; and it is also for propagating succulent plants by their cuttings. Look over the Anemonies, and other kinds intended for seeds: once a week break the surface of the beds about them; and every two or three days allow a moderate watering. Now propagate fibrous rooted flowers by layers, and begin by Carnations and Pinks. Look to these layers every other day, and see they all keep in their due place; and when the mould is dry you must give them a gentle watering.

The roots of such of the bulbous, and tuberous spring-flowers, as have their leaves now decayed must be taken up, cleaned, and laid to harden: many of the Ranunculuses, Anemonies, and Tulips are about the middle of June ready for this. Observe where the tuberous rooted flowers and bulbs, that will not bear to be kept long out of the ground: they must be taken up and planted in new mould. About this time if the weather proves dry, take out of the ground the Hyacinth roots, which were laid side-ways under the mould for swelling.

Examine

Examine the Carnations from day to day as they are swelling for the flower.

The spring, perennial, fibrous-rooted plants, which have done flowering, must be cut down, near the ground, and some mould drawn up over the stumps: cut some sticks of different lengths, and tie up to them the stalks of those plants which are yet to come into flower. Let some mould after this be drawn about the head of the root, and the dead leaves taken away. Transplant out of the seed-beds the perennial fibrous-rooted flowers, as also the biennial kinds. Inoculate the several kinds of Jasmine; destroy weeds with great care, as this month is their seed-time. Dig about those plants which are to flower in autumn, and let them have moderate waterings. Cut off straggling branches; tie up the rest with the main stem, and form the spreading plants into good heads. Inoculate the finer sort of roses which do not freely produce suckers. Take off such flowers as are past their beauty, and give these plants every evening a gentle watering: next examine those which are opening for seeds; if any new bloom offers upon these take it off: flowers at this time will not be fine, yet they will starve and hurt the seeds. Stir the mould about the plants with a trowel; and if the seeds be young, allow gentle waterings; but those plants which are full grown, must not have any. See the sticks to which these are tied up, stand firm and secure; then pass to those autumnal kinds, which are coming to their growth, and preparing for flowering. Part of these are the annuals removed out of the hot-beds, and part the seedling biennials of the last autumn from the nursery. Sticks have been thrust down by these, proportioned to the heights of the plants; when they come to flowering, as they have risen above the last tyings, let them be now fastened up again. If there be any straggling branches, let them be removed; then give a full free watering to the leaves, buds and soil: if any are full grown, let the head of the sticks be cut off to the level of their top branches; then let the earth be drawn up about the stem, and the plant is in perfection for flowering. While the buds remain unopened, the waterings must be large and given all over the plant; but when the flowers open, they must be more moderate.

In the *Seminary* look to the beds and boxes of seedling spring flowers. The leaves will be decayed by this time, and their tender roots must be refreshed by a covering of the same mould: let the surface of the whole bed or box be gently raked, to gather up all moss or seedling-weeds, in performing which the greatest care must be observed not to disturb the young roots of the plants. After this an inch deep of the same mould should be sifted over them; and they are to remain so the rest of the summer.

Let the beds be always weeded by hand, and care taken not to disturb the young plants. After this they must be watered every evening; and it will now be proper to defend them from the noon-sun by a reed-hedge. Where the trees are of more growth, and planted out in rows at due distances, nothing is so proper as digging between them with a spade. Lay the branches of the Passion-flower, Clematis, and other such shrubs: the mould must be kept moist by frequent waterings. Chuse branches which can be brought down with the least force, and let them be twisted and pierced through with an awl in several places, where they are to come under the mould: cover them four inches, and peg them down in two or three places, that neither the springiness of the branch itself, nor the force of the wind, may endanger the tearing it up. The flowers which were sown in April will now be grown to proper size for transplanting. Plant cuttings of hardy shrubs, and trees in the open ground. Hardy exotic trees may be laid about the middle of this month for an increase. Go over the evergreens with a knife, reducing the rude growth of branches: their stems must be covered, and this can only be done by taking off the luxuriant growth of the young shoots.

Continue weeding and digging between and about the new planted trees, throughout the ground; and if the

season be dry, they must be watered. Plant cuttings of fibrous-rooted plants, closing the mould about them, and allowing good watering. Water the seedlings of hardy exotic trees, but this must be done with great caution: inoculate the earlier Peaches and Nectarines, toward the end of this month.

In the *Fruit-garden*. About the beginning of this month look over the stocks for inoculating of stone-fruits, and mark such as are for the earlier kinds. Look over all wall-fruit trees, where any leaves are decayed, take them off; where fore-right shoots have been produced, rub these off also; and where such grow in a better direction, as will be wanted the succeeding year, bring them to order, fixing them to the wall, taking care not to disturb the fruit, nor even hurt the leaves. Extirpate weeds from the stems of fruit-trees. Thin the fruit; dig the borders with a three-pronged fork; and rake the borders after this digging, to take off the weeds; and if the trees require more assistance, spread some rich mould with foot an inch thick, all over the border. Espaliers must be treated in the same manner as the wall-trees; and when the ill-growing shoots are rubbed off, and those which are wanted, and which are risen in proper places duly trained, digging, clearing, and enriching the border, is to be repeated. About the middle of this month, let some of the later Apricots be inoculated, and the earlier Peaches. Look to new planted trees secured by stakes, and those against walls and espaliers; if they rock about now they will soon be destroyed. The new shoots of wall and espaliers trees, that grow properly, must be fastened down in different places. Look frequently over the fruit-trees: those which appear less vigorous than the others must be refreshed by turning up the mould about their roots, with a three-pronged fork, and it will be serviceable to sprinkle on a little rotten dung, and work it into the ground, by repeated, and not too slight waterings. If any leaves are infested with insects, let them be pulled off.

Care must be taken to destroy snails and all other insects. Clear the vines planted against the walls of weak and useless branches: let all side-shoots be displaced. Rub off fore-right shoots; train and keep in their proper places, those which have been suffered to remain, from more proper parts of the wood. Dig and water the ground, and keep the stems of trees perfectly clear from moss.

In the *Kitchen-garden*. Let the weeds be every where destroyed by the hand, by the hoe, or by the spade, according to the condition of the several crops, among which they grow; and as the seeds of many weeds will ripen as they lie on the ground, and by means of the down annexed to them, be carried every where about the garden, let care be taken to prevent it. When the crops are cleared, let them have a moderate watering. Plant new crops upon the piece of ground cleared from the early growths, first enriched by some good old dung well laid in. Upon a piece of ground thus prepared, sow some Brocoli for a second crop: dig another piece of the same ground to plant some French-beans; lay out a piece of ground for blanching of Celery. Transplant Cabbages and Savoy for winter-use. The Cos-lettuces which are in condition for gathering, must be taken up from time to time: mark some for seed. Chuse an open spot of ground for transplanting a good crop of seedling Endive. Transplant the young Cauliflower-plants raised for winter. Sow Cabbage-lettuces for a late crop. Transplant the seedling Brocoli. The late crop of Cucumbers in holes for pickling, will be now up, and require some care.

About the middle of this month Melons will set for fruit. Plant out the sweet herbs that have been raised from seed. Young fallading may be raised in as great perfection at this time as at any other. Chardons will now be fit for planting out, to be blanched: save seeds from such crops as now ripen them; let the young crops be weeded and watered. About the end of this month dig two pieces of ground for Celery and Endive.

In the *Green-house*. Look to the plants which are now set out for summer; stir the earth on the surface in

all the pots, and where there is occasion, bring in a little fresh, spreading it over the surface, and gathering it up about the stem. Pick off dead or decaying leaves, rub and wash away any foulness from the stem, and even upon the leaves of those which have large ones: and according to the condition and nature of the plants, let them have the benefit of watering. The Orange-tree, which is the principal glory of a common green-house plant, now requires particular attention. When flowers break out upon a plant that is ripening its seed, they should be destroyed, and whatever buds offer for flowering, should be pulled off as soon as seen.

In the *Stove*. There is no season of the year in which cleanliness is more necessary than this month, in which the plants are more subject to filth upon their stems, and insects upon their tender shoots and leaves. A sponge and warm water must be used, and if the disorder be great, the water must be impregnated with tobacco stalks and foot: every part must be cleaned with this, the young shoots and leaves with the sponge, and the stems with a small brush first, and afterwards with a flannel dipt in the same water. What began in the bark-bed, must be continued throughout the whole stove.

JUNIPER, *Juniperus*, a genus of plants, ranged by Linnæus among the *dicecia monadelphia*, and of which there are thirteen species. 1. Juniper, with spreading, sharp-pointed leaves, placed by threes; or the common Juniper. 2. The Tree; or Swedish Juniper. 3. Cedar of Virginia; or Red Cedar. 4. Juniper, commonly called Carolina Cedar. 5. Juniper, commonly called Cedar of Bermudas. 6. Great Juniper, with blue berries. 7. Greater Juniper; or Cedar with a Cypress-leaf, and yellowish fruit. 8. Middle Juniper; or Cedar with a Cypress-leaf, and larger berries. 9. Greatest Juniper, with a Cypress-leaf; commonly called Jamaica berry-bearing Cedar. 10. Common Savin. 11. Upright berry-bearing Savin. 12. Great Juniper, with a brownish berry. 13. Taller Spanish Cedar, with a very large black fruit.

The first sort grows naturally upon chalky lands in many parts of England. This is a low shrub, seldom rising more than three feet high, sending out many spreading branches, covered with a brown bark, decorated with narrow awl-shaped leaves, ending in acute points, placed by threes round the branches, which are of a greyish colour and continue through the year; the male flowers sometimes are situated at distances on the same plant with the female, at other times they are upon distinct plants: the female flowers are succeeded by roundish berries, which are green, but when ripe are of a dark purple colour; the berries ripen in the autumn.

The second sort is known in the gardens by the title of Swedish Juniper. This rises to the height of ten or twelve feet, the branches grow more erect, the leaves are narrow, and end in more acute points: they are placed farther asunder on the branches, and the berries are larger than those of the first species. It grows naturally in Sweden, Denmark, and Norway.

The third sort grows naturally in most parts of North America, where it is called Red Cedar, to distinguish it from a sort of Cypress, which is there called White Cedar: of these there are two, if not three varieties, besides the species here enumerated, one of which has leaves in every part like those of the Savin, and upon being rubbed, emit a very strong ungrateful odour, and is commonly distinguished in America by the title of Savin-tree. There is another with leaves very like those of Cypress: but as these generally arise from the same seeds when they are sent from America, so they are only feminal variations.

The lower leaves of the fourth sort are like those of the Swedish Juniper, but the upper leaves are like those of the Cypress: and this difference is constant, when the seeds are carefully gathered from the same tree; but as most of those people who send over these seeds, are not very careful to distinguish the difference, so it often happens that the seeds of two or three sorts are mixed together, which has given occasion to people to imagine

them but one; but all the leaves of the third sort are like those of the Juniper, so the gardeners call that the Red Virginia Cedar, and this Carolina Cedar, though they grow naturally in Virginia.

The fifth sort is the Bermudas Cedar, whose wood has a very strong odour.

These plants, while young, have acute-pointed leaves, which spread open, and are placed by threes round the branches; but as the tree advances, so their leaves alter, and the branches are four-cornered; the leaves are very short, and placed by fours round the branches: these are of a dark red colour, inclining to purple.

The sixth sort grows naturally in Istria. This has spreading branches growing thinly decorated with awl-shaped, acute-pointed leaves, placed by threes, of a dark green, and not very close to each other: they grow horizontally, pointing outward: the berries are much larger than those of the common Juniper, and are blue when ripe.

The seventh species grows naturally in Portugal. This sort grows with its branches in a pyramidal form: the lower ones are decorated with short, acute-pointed, greyish leaves, placed by threes, pointing outward: but those on the upper branches are of a dark green, lying over each other like the scales of fish, ending in acute points. The male flowers are produced at the extremity of the branches: they are situated in a loose, scaly, conical katkin, standing upon short foot-stalks erect; the fruit is produced sometimes upon the same tree, at distances from the flowers, and at other times they are upon separate trees; the berries of these are of a pale yellow when ripe, and about the size of those of the common Juniper.

The eighth sort grows naturally in Spain and Italy. The branches of this sort grow erect, and are covered with a brown bark. The leaves are small, obtuse, and lie over each other like the scales of fish. The male flowers grow at the extremity of the branches in a conical katkin, and fruit grows single from the sides of the branches below the katkin, on the same branch. The berries are large, oval, and when ripe are brown.

The ninth sort grows naturally in Jamaica, and also in the other islands of the West-Indies, where it rises to be one of the largest timber trees in those countries. The branches spread wide, and the leaves are extremely small. The bark is rugged, of a dark colour, and splits off in strings. The fruit is small, and of a light brown colour when ripe.

The tenth species is the common Savin. This grows naturally in Italy, Spain, and the Levant, upon the mountains where it is cold. It sends out its branches horizontally, and seldom rises more than four or five feet high. The leaves are very short, acute-pointed, placed opposite, and their ends point upward. This sort seldom produces either flowers or seeds, when it is transplanted into gardens. The berries are smaller than those of the common Juniper, but of the same colour and a little compressed. The whole plant has a very rank strong odour when touched.

The eleventh sort has been by many, supposed to be only an accidental variety of the former, but the difference between them is very conspicuous: for the branches of this grow more erect, the leaves are shorter, and end in acute points which spread outward. It grows naturally on the Alps, where it rises to the height of eight or ten feet, and produces great quantities of berries.

The twelfth species grows naturally in Spain, Portugal, and the south of France. It rises ten or twelve feet high, sending out many small taper branches without angles, the whole length of the stem. The leaves are small, obtuse, and lying over each other like the scales of fish. The male flowers are situated at the ends of the branches in conical scaly katkins, and the berries grow below from the same branches. These are larger than those of the common Juniper, and when ripe are brown.

J U N

The thirteenth sort is a native of Spain and Portugal, where it rises from twenty-five to thirty feet high, sending out many branches which form a pyramid. The leaves are acute-pointed, and lie over each other four ways, so as to make the branches four-cornered. The berries are very large and black when ripe.

Culture of the JUNIPER.

These plants are all propagated by seeds, and such as will bear the open air of our climate should be sown as soon as they are ripe, if they can be procured; for when they are kept out of the ground till spring, they will not come up that year. The ground in which the seeds of the hardy sorts are sown, should be fresh and light, and not dunged: it must be well dug, levelled even, and the seeds should be sown thereon pretty thick, and let the earth be sifted over them about an inch thick. This bed will require no other care than to be kept clean from weeds, and in dry weather refreshed with water; and if the bed is much exposed to the sun, it should be shaded with mats in the day. In this bed let the plants remain till the second autumn, when some beds must be prepared to transplant them in: these should be of such earth as the former, levelled, and cleared from weeds and roots. About the beginning of October the plants should be removed, with as much earth as possible to their roots, and planted into those beds, about five or six inches each way, and watered. Here they may remain two years, taking care to keep them clean from weeds. In the spring the ground must be stirred gently between them: after which they should be transplanted either into a nursery, at the distance of three feet, row from row, and eighteen inches asunder in the rows: or into the places where they are to remain for good.

In order to have these trees aspire in height, their under branches should be taken off, especially where they are inclined to grow out strong: but they must not be kept too closely pruned, which would retard their growth; for all ever-greens do more or less abound with a resinous juice, which is very apt to flow in hot weather, in such plenty from the places which are wounded, as to render the trees weak and unhealthy.

The more tender species of this genus are also propagated by seeds, which must be procured from the countries where they grow naturally.

The Bermudas Cedar and the Jamaica Juniper will not live through the winter in the open air of our climate; the seeds must therefore be sown in pots, and plunged into a moderate hot-bed. When the plants come up, they must each be removed into a separate pot, and after they have taken fresh root, they must by degrees be inured to the open air, but always observe to house them in winter.

The seeds of the rest may be sown as was directed for the hardier sorts. When the plants come up they must be carefully weeded, and in dry weather should be refreshed with water, which will greatly forward their growth; the autumn following they should have a little rotten tan laid between them to keep out the frost. In this bed the plants may remain for two years, then they should be transplanted into other beds for two years more, observing all the time to keep them clean from weeds; and in winter lay a little fresh mulch upon the surface of the ground round their roots, which will prevent the frost from penetrating to them, and effectually preserve them: for while the plants are young, they are liable to be injured by very hard frosts: but when they have attained a greater strength, they will resist the severest cold of our climate.

After two years they should be either removed into a nursery, or transplanted where they are designed to remain, always observing to take them up carefully, otherwise they are subject to fail upon transplanting: and also to mulch the ground and water them, till they have taken root; after which they will require no other care than to keep the ground clean about their roots, and to prune up their side branches to make them aspire in height.

J U S

JUPITER's BEARD; *Barba Jovis*, a species of Anthyllis.

This is a shrub which often grows ten or twelve feet high. The leaves are hairy and very white, for which reason it is called by many Silver Bush. The flowers are situated at the extremities of the branches, collected into small heads; their colour is a bright yellow, and they appear in June.

Culture of JUPITER's BEARD.

It is propagated either by seeds or cuttings: if by seeds they should be sown in the autumn, in pots filled with light earth, and placed under a frame in winter to protect them from frost. The following spring the plants will rise: and when they are strong enough to remove, they should be each planted in a small pot filled with light earth, and placed in the shade till they have taken new root: after which they may be placed with other hardy exotic plants in a sheltered situation, where they may remain till October, when they must be removed into the green-house.

If it is propagated by cuttings, they may be planted in pots during any of the summer months, observing to water and shade them till they have taken root, after which they may be treated as directed for the seedling plants.

JUSSIEA, a genus of plants, for which we have no English name: there are five species of it. 1. Upright hairy Jussiea, with four-leaved flowers on foot-stalks, and eight filaments in each. 2. Hairy Jussiea, with an erect branching stalk, flowers having five petals, and ten stamina, which sit close to the stalks. 3. Smooth upright Jussiea, with four petals, and eight stamina to the flowers, which sit close to the stalk. 4. Jussiea, with an upright, branching, smooth stalk, flowers having four petals, and eight stamina sitting close to the stalk, and spear-shaped leaves. 5. Jussiea, with a single, upright, hairy stalk, spear-shaped leaves, flowers which have five petals, and ten stamina sitting close to the stalk.

The root of the first species is white, and hung with innumerable fibres. The stem is firm and almost woody: the height three feet, and the branches numerous. The main stem has the remains of four ridges, and the younger shoots are absolutely square. The bark is brown, with a tinge of red on the older parts, but on the younger it is pale: and the young shoots are lightly hairy. The leaves are numerous, and of an elegant form, oblong, moderately broad, undivided at the edges, and sharp-pointed; they stand alternately on the branches, and they have very short foot-stalks: those on the extreme parts none; they are broadest toward the middle, and truly lanceolate. Their colour is a strong green on the upper side, and a faint or whitish green below: and they are lightly hairy, soft to the touch, and of a tender substance. The flowers are small and of a delicate yellow; they stand in the bosoms of the leaves, the rudiments of the fruit serving in the place of foot-stalks. Each flower has its cup: this stands together with it on the rudiment, and is small, and composed of four little oval pointed leaves, which cohere at the base, and remain after the flower is fallen. The body of the flower is composed of four roundish petals, which spread wide open, and the filaments are eight: they are short, and they have roundish buttons. The style is single and slender, and its head is thick, and marked with five ridges. The seed-vessel is oblong, thick, crowned with the cup, and filled with numerous seeds in several series. It is this seed-vessel, which throughout the whole time of the plants flowering, makes so conspicuous a figure. It is an inch in length, and has the ridges slight, and the crown large. They are of a pale green at first, afterwards of a deep brown: and they resemble in this last condition extremely, the common Clove Spice.

The second sort grows naturally in Jamaica. This rises with a hairy branching stalk two feet high, with narrow spear-shaped leaves, placed alternate. The flowers are situated toward the ends of the branches, and sit close to the stalks; they are composed of five large yellow petals.

The

The third species is also a native of Jamaica. It rises with a smooth erect stalk, three feet high. The leaves are long, narrow, smooth, and spear-shaped. The flowers are large and yellow.

The fourth species grows near Carthagen. It has a branching smooth stalk, three feet high. The leaves are heart-shaped, and stand upon short foot-stalks. The flowers are small, yellow, and composed of four petals.

The fifth species is a native of La Vera Cruz. It rises with single, upright, red, hairy channelled stalks, three feet high. The leaves are spear-shaped, and placed alternate, standing nearer together than in any of the other sorts. The flowers appear from the wings of the leaves on the upper part of the stalk, and are composed of five large yellow petals.

Culture of the JUSSIOEA.

All these sorts are propagated by seeds, which should be sown early in the spring, on a moderate hot-bed. When the plants come up and are fit to remove, they should be each planted in a separate small pot, and plunged into a hot-bed of tanners bark, where they should be shaded from the sun till they have taken new root, after which they should have free air admitted to them every day, in proportion to the warmth of the season.

When the roots of the plants have filled these small pots, they should be transplanted into others, a size larger; and if the plants are too tall to stand under the frames of the hot-bed, they should be removed into the bark-stove, where they may remain to flower, and perfect their seeds; for when the plants rise early in the spring, and are brought forward in hot-beds, all the sorts will flower and perfect their seeds the same year.

JUSTICIA, a genus of plants, of which there are eight species. 1. Justicia, with oblong, oval, hairy leaves, sitting close to stalks, and flowers growing in spikes from the sides of the stalks, which are shrubby. 2. Justicia, with an erect branching stalk, having six angles, oval leaves placed opposite, and wedge-shaped, small leaves growing in clusters. 3. Justicia, with oval, spear-shaped leaves, growing on foot-stalks, heart-shaped, acute-pointed bractæ, and a shrubby stalk. 4. Tree Justicia, with oval, spear-shaped leaves, oval permanent bractæ, and a concave helmet to the flower; commonly called Malabar Nut. 5. Shrubby Justicia, with entire, spear-shaped leaves, footstalks having three flowers looking different ways, and bractæ shorter than the empalement; commonly called Snap-tree. 6. Prickly Justicia, with oblong, oval leaves, indented at their edges, and a shrubby branching stalk. 7. Tree Justicia, with spear-shaped, oval leaves, woolly on their under side, sitting close to the stalks, and spikes of flowers growing in clusters, at the ends of the branches. 8. Tree Justicia, with spear-shaped, oval leaves, oval pointed bractæ, which fall off, and a reflexed helmet to the flowers.

The first species grows naturally at La Vera Cruz, where it rises with a shrubby brittle stalk five or six feet high, and sends out many branches. The leaves are oval, oblong, hairy, and placed opposite. At the wings of the leaves are placed the spikes of flowers; they are large, of a fine red colour, and are succeeded by pods about half an inch long.

The second species is a native of the same place. It has an upright shrubby stalk, with six angles, which rises from two to three feet high, dividing into many branches. The leaves are oval, and placed opposite. At each joint appear clusters of small wedge-shaped leaves, or bractæ. The flowers are situated in small spikes at the ends of the branches, sitting very close among the leaves; they are composed of one petal, which has two lips: the upper lip is arched, bending over the lower, which is also a little reflexed, but both are entire. Their colour is a beautiful carmine: and they are succeeded by short wedge-shaped capsules, opening lengthways, and inclosing two small oval seeds.

The third species, which is a native of Campeachy, rises with a hairy, shrubby stalk, four or five feet high,

dividing into several branches. The leaves are oval, spear-shaped, hairy, and stand upon opposite foot-stalks. The flowers appear in loose clusters from the wings of the stalks, toward the ends of the branches: they are of a pale red colour, and shaped like those of the former sort.

The fourth species is a native of the island of Ceylon, and has been long known in our gardens by the title of Malabar Nut. It rises here with a strong woody stem to the height of twelve or fourteen feet, sending out many spreading branches. The leaves are oval, spear-shaped, six inches long, and three broad, and placed opposite. The flowers are placed at the ends of the branches on short spikes; their colour is white with some dark spots, but they are not succeeded by any seeds in England.

The fifth species is a native of India, and rises with a shrubby stalk from three to four feet high, branching out on every side from the bottom, so as to form a kind of pyramid. The leaves are spear-shaped, smooth, stiff, entire, near two inches long, one third of an inch broad, of a deep green, and standing opposite. At the base of the foot-stalks are situated clusters of smaller leaves, of the same shape and texture. The flowers appear upon short foot-stalks, from the sides of the branches, each foot-stalk supporting one, two, or three white flowers, with long empalements, these are succeeded by oblong seed-vessels, which when ripe, cast out their seeds with great elasticity, from whence it had the appellation of Snap-tree.

The sixth species is a native of Jamaica. It rises with many shrubby slender stalks, about five feet high, sending out branches on every side, which are covered with a whitish bark. The leaves are small, oval, oblong, and are placed opposite. Under the leaves, at every joint, are placed two sharp thorns. The flowers appear singly at the wings of the leaves; they are small, of a pale red colour; and shaped like those of the other sorts.

The seventh species, which is a native of Campeachy, rises with a strong woody stem twenty feet high, dividing into many crooked irregular branches, covered with a light brown bark. The leaves are spear-shaped, oval, near four inches long, two broad, and covered on their under side with a soft down. The flowers grow in spikes at the ends of the branches; three, four, or five of these spikes arising from the same point, the middle spike being near three inches long, and the others about half that length. The flowers are small and their colour is white.

The eighth species grows naturally at Malabar, and in Ceylon. It rises with a strong woody stem ten or twelve feet high, dividing into many branches. The leaves are oval, spear-shaped, five inches long, two and a half broad, of a lucid green and placed opposite. The flowers grow in very long spikes from the ends of the branches; their colour is greenish, with a shade of blue.

Culture of the JUSTICIA.

The three first species are propagated by seeds, which should be sown early in the spring, in small pots, and plunged into a moderate hot-bed of tanners bark. The seeds of this plant frequently lay a year in the ground, so that the pots must not be disturbed, if the plants do not come up the same year; but in the winter should be kept in the stove, and the spring following plunged into a fresh hot-bed, which, if the seeds were good, will bring up the plants. When they are about two inches high, they should be carefully taken up, and transplanted each into a separate small pot, and plunged in the hot-bed again, observing to water and shade them till they have taken new root; after which they should have air admitted to them every day, in proportion to the warmth of the season, and duly watered in hot weather.

As the plants advance in their growth, they should be shifted into larger pots. The second species is an annual, and the plants should always remain in the hot-bed, being careful to let them have a due proportion of air in warm weather, that they may be brought as fast as possible

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sible in the spring; for if the plants do not flower early they will not produce good seeds in England.

The first and third sorts should remain in the hot-bed during the summer season, if there is room under the glasses without their being scorched, but at Michaelmas they should be removed into the stove, and plunged into the bark-bed, where they must remain during the winter season.

The following summer these plants will flower, and abide several years, but rarely produce good seeds in Europe.

The fourth species may be propagated by cuttings, which, if planted in pots in June or July, and plunged into a very moderate hot-bed, will take root: they must be shaded from the sun, and if the external air is excluded from them, they will succeed better than when it is admitted.

It may also be propagated by laying down the young branches, which will take root in one year, and should then be put each into a separate pot, and placed in the shade till they have taken new root; when they may be removed to a sheltered situation during the summer, and in the autumn they must be placed in the green-house, and treated in the same manner as Orange-trees, only allowing them more water.

The fifth species is propagated by cuttings during any of the summer months, which should be planted in pots, and plunged into a very moderate hot-bed, where they must be shaded from the sun. In about two months they must be gradually inured to bear the open air, into which they should be removed, placing them in a sheltered situation, where they may stay till autumn; but if they take root early in the summer, it will be proper to separate them each into a single small pot, setting them in the shade till they have taken new root, after which they may be placed as before directed: but when it is late in the season before they take root, it will be better to let them remain in the same pots till the following spring.

In winter these plants must be placed in a warm green-house, or in a moderate warm stove, for they are impatient of cold and damp, nor will they thrive in too much warmth; they will often require water in winter, but it must be given them very moderately. In summer they must be removed into the open air, but should have a warm sheltered situation, and in warm weather they must have plenty of water.

The sixth, seventh, and eighth species are propagated by seeds, in the same manner as the three first, and must be treated in the same way, especially while they are young, but afterward the eighth sort may be more hardily treated.

The eighth species may also be propagated by cuttings in the same manner as the fifth; and when the plants are two or three years old, they will thrive in a moderate degree of warmth in winter, and in summer they may be placed abroad for two months in the warmest season of the year; but they should have a warm sheltered situation, and when the nights begin to grow cold, they must be removed into the stove, but they must have free air admitted to them at all times when the weather is warm.

The sixth and seventh species should constantly remain in the bark-stove, and require the same treatment as other tender plants from the warmest countries.

IVY-TREE, *Hedera*, a genus of plants ranged by Linnæus among the *pentandria monogynia*, and of which there are only two species. 1. Ivy-tree with oval and lobed leaves, or the great common Ivy. 2. Ivy-tree with five oval, sawed leaves, growing together, commonly called the Virginia Creeper.

The first sort grows naturally in most parts of Europe, particularly in England, where, when it meets any neighbouring support, it rises to a great height; it may be trained up to items, or suffered to remain climbers to cover walls, pales, &c. While the stalks of this plant trail either on the ground, or walls, or any other support, they do not produce flowers; but when the branches get above their support they produce flowers at

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the end of every shoot.

The second sort is a native of North America, and is cultivated in our gardens chiefly to plant against walls or high buildings to cover them; which these plants will do in a short time; for they often shoot twenty feet in one year.

Culture of the IVY-TREE.

The first species is propagated by its trailing branches which put out roots their whole length. These branches being cut off and planted, will grow in almost any soil or situation. They may also be propagated by seeds, which should be sown soon after they are ripe.

The second species is propagated by cuttings which, if planted in autumn, on a shady border, will take root, and, by the autumn following, be fit to plant where they are designed to remain.

IXIA, a genus of plants for which we have no English name. 1. Ixia with sword-shaped leaves, and flowers standing distant. 2. Ixia with flowers growing in heads, and ragged sheaths. 3. Ixia with sword-shaped, hairy, veined leaves, and flowers growing in spikes at the ends of the stalks. 4. Ixia with narrow, sword-shaped leaves, and flowers proceeding from the sides and tops of the stalks. 5. Ixia with smooth, spear-shaped leaves, and flowers growing in a corymbus terminating the stalk. 6. Ixia with narrow, sword-shaped leaves, flowers placed alternate, and stalks bearing bulbs at the joints. 7. Ixia with sword-shaped leaves. 8. Ixia with narrow sword-shaped leaves, and sessile flowers growing in spikes at the tops of the stalks. 9. Ixia with smooth sword-shaped leaves, flowers placed distant alternately, and pointed petals which spread open.

All these species are natives of the Cape of Good Hope. The root of the first is thick, fleshy, and divided into joints of a yellowish colour, sending out many fibres. The stalk, which rises to the height of three or four feet, is thick, smooth, and jointed. The leaves are a foot long, and one inch broad, having several longitudinal furrows, they embrace the stalks with their base, and end in acute points. The upper part of the stalk divides into two smaller, with a footstalk rising between them, which supports one flower: the smaller branches divide again in the same manner into footstalks, which are two inches long, and each sustaining one flower, composed of six equal petals, of a yellow within, variegated with dark red spots; and of an orange colour without. These appear in July and August, and in warmest seasons are succeeded by seeds.

The second species rises no more than three or four inches high. The leaves are narrow and veined. The flowers are small, and grow on a downy head on the top of the stalk; they make very little appearance so are only preserved in botanic gardens for the sake of variety.

The third species has a bulbous root a little compressed, covered with a red skin, from which rise five or six sword-shaped leaves about four inches long, hairy with several longitudinal furrows, they embrace each other at their base, and between them is placed the flower-stalk, which rises six or eight inches high, naked to the top, and terminated by a cluster of flowers, each having a spatha or hood which dries and is permanent. The flowers, which are of a deep blue, are succeeded by roundish three-cornered seed-vessels with three cells, filled with roundish seeds.

The fourth species has a small, round, bulbous root, from which rise four or five narrow sword-shaped leaves about seven inches long, between these come out a very slender round stalk, about ten inches long; on the side of which is situated one or two clusters of flowers, standing upon short foot-stalks, and at the top of it the flowers grow in a loose spike; they are of a fine white, and shaped like those of the other species.

The root of the fifth species is oval, bulbous, and a little compressed, from this come three or four narrow, thin, sword-shaped leaves, near a foot long. The flower-stalk rises a little above the leaves; it is very slender, naked, and terminated by a round cluster of flowers composed of six large, oblong, concave petals, of a deep

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yellow colour each having a large black spot at their base. It flowers early in May, and the seeds ripen the latter end of June.

The sixth species has narrow sword-shaped leaves, rising from the root, about seven inches long. The stalk is near a foot and a half high, and one leaf is placed at each of the lower joints, of the same shape with the others, but smaller; these embrace the stalk with their base and stand erect. The upper part of the stalk is adorned with flowers composed of six oblong, oval, whitish petals, having a blue stripe on their outside; these are placed alternate on the stalk, which is bent at each joint where the flowers stand; they have three short stamina, which are joined at their base, terminated by long, flat, erect summits; the germen is situated under the flower, supporting a long slender style, crowned by a trifid stigma. The germen afterwards becomes a roundish capsule with three cells, filled with roundish seeds.

The seventh species has shorter and broader leaves than the sixth. The stalk is slender and furrowed, at each of the lower joints is placed one leaf, of the same shape with the former, embracing the stalk with their base. The flowers grow toward the tops of the stalks at two or three inches distance, each stalk supports two and sometimes three pale yellow flowers, which are composed of six spear-shaped petals an inch and a half long; these are succeeded by round capsules with three cells, filled with round seeds.

The eighth species has very small, round, bulbous roots from which rise four long, slender, grass-like leaves, of a deep green colour between these is situated the stalk, which rises a foot and a half high. The flowers adorn the top of the stalk; and their colour is white, and they are shaped like those of the other species but smaller; they are succeeded by small, round, seed-vessels with three cells, each containing two or three round seeds.

The ninth species has a round, compressed, bulbous root, from which rise three or four broad sword-shaped leaves a foot and a half long. The stalk rises two feet high, and on this the flowers are placed alternately; they are much larger than those of the former species; and of a beautiful red colour, composed of six equal petals which spread open, they are succeeded by an oval capsule with three cells, including several round seeds.

Culture of the IXIA.

The first species may be propagated either by seeds or parting of the roots: if by seeds they should be sown in pots soon after they ripe, and plunged into an old hot-bed, under a frame: in spring the plants will come up, when they should be inured to the open air by degrees, and in summer wholly exposed to it. The following autumn they must be separated; some of the plants may be set in a warm border, where they live through the winter very well, if it is mild; but in very severe frost they should be covered with tan, to protect them from it.

The rest may be planted in pots, and sheltered under a common frame during the winter.

In the spring, before the plants shoot, is the proper time for parting the roots, but this should not be done oftener than every third year, for when they are frequently parted, they grow weak, and flower badly. All the other species multiply very fast by off-sets, so that when once obtained, there will be no longer occasion to raise them from seeds. These plants will not live in the open air of our climate in the winter, so the off-sets should be planted in pots, and at that season placed under a frame, but in mild weather the free air must be admitted to them. Care should be taken to protect them from mice who are very fond of their roots.

IXORA, a genus of plants ranged by Linnæus among the *tetrandia monogynia*. He distinguishes several species of this genus, but the most beautiful of these, and the culture of which the gardener will find a sufficient direction for that of all the rest, is *Ixora* with oval

leaves which partly embrace the stalk, or the *Crimson Ixora*.

The root is long, and penetrates to a great depth in the earth, and is brown on the outside, red within, and full of juice. The main stems are of a dusky purplish brown hue; and the young shoots grey. The leaves stand in pairs, and are large and handsome; those on the lower part of the branches have short footstalks, those on the upper none: and of these last, such as stand nearest at the base: they are of an oval form, and firm substance. Their colour on the upper side is a fine strong brownish green, bright and shining; and on the under side more pale and dead. The flowers crown the tops of all the branches in large tufts, and they are of a glowing crimson, and afterwards paler, and as they fade yellowish; they have no scent. Each flower has its cup, which is formed of a single piece, cut into four parts at the edge, and permanent. The flower is formed of a single petal, tubular at the base, and cut into four parts at the edge. The tube is very long and slender, and is of the same crimson with the rest of the flower; this gives a singular aspect to the whole, and each flower seems to have its long slender footstalk: the four parts unite at the head of this tube, and are therefore nothing more than segments. These segments are oval, flat, and expanded. The filaments are four; they are very short and crooked, and they are placed in the divisions of the flower, and crowned with oblong buttons. The style is single, and of the length of the tube; it rises from a round rudiment in the base of the cup, and is crowned with a head split into two parts. The fruit is a roundish berry, and divided into cells; in each of which are two seeds, angular on one side and convex on the other.

Culture of the Crimson IXORA.

It is a native of the warmest parts of Asia, and America; and with us will never shew its full beauty, unless it be allowed the advantage of the stove.

The method of propagating the shrub should be by layers: the seeds never ripen perfectly in cold climates, and there is great uncertainty in getting them in a growing condition, from the Indies, but the first raising of the shrub must be from these, when they can be obtained.

The seeds should be brought over in the berries and as soon as received in England they should be shook out upon a papered shelf, and turned every day to harden: after this they are to be tied up in paper bags, and so kept till spring.

In the beginning of March fill a pot of some of the light compost, scatter the seeds upon this, and sift over them half an inch of the same mould. Set the pot up to the rim in a bark-bed, and once in three days the mould must be very lightly watered: when a good plant has thus been once obtained, the layers are the right practice.

In March, two or three boxes of rich compost should be placed about the shrub, and raised to such a height that a branch may be easily brought down to each. This is to be laid in the usual manner, securing it well in its place, and let it be frequently refreshed with water. The warmth of the air, and the moisture added to the vegetative vigour of the tree, will make them soon take root. In June they will be ready to take off from the old plant; and they must then be planted with care in separate pots: they must be shaded and watered till they have taken root, and they will afterwards require no more care than that bestowed on other stove plants.

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KALMIA, a genus of plants for which there is no English name, and only two species. 1. *Kalmia* with oval leaves, and flowers growing in bunches terminating

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terminating the branches. 2. *Kalmia*, with spear-shaped leaves, and flowers growing in round bunches on the sides of the stalks.

The first species is a native of several parts of North-America, where it rises from six to twelve feet high, dividing into many ligneous branches, covered with a dark grey bark; they are generally crooked and irregular, but are closely garnished with stiff leaves about three inches long and one broad, of a lucid green, standing upon slender foot-stalks; the flowers grow in loose bunches at the end of the branches, upon long foot-stalk; they are of one petal, with a short tube, which spreads open at the top, where it is cut into five angles; the flowers are of a bright red colour when they first open, but afterwards fade to a blush or peach bloom colour; these are succeeded by roundish, compressed seed-vessels, crowned by the permanent style, divided into five cells, which are filled with small roundish seeds.

The second sort grows naturally in Pennsylvania, where it rises four or five feet high. The leaves of this sort are about two inches long, and half an inch broad in the middle: they are stiff, of a lucid green, and stand opposite: sometimes they are by pairs at each joint, and at others there are four, two on each side, standing upon very short foot-stalks; the flowers come out in clusters on every side the stalks: they are of a beautiful red colour, and shaped like those of the first sort, but smaller: they are succeeded by short, roundish, compressed capsules, with five cells, crowned by the permanent style, and filled with very small seeds. This shrub in its native country, continues flowering most part of summer.

Culture of the KALMIA.

Both these sorts multiply by their creeping roots in their native soil: and where they have stood unremoved a considerable time, they put out suckers in great plenty; and as these plants which come from suckers, are much more likely to produce others than those which are raised from seeds, and will flower much sooner, so the plants should not be removed, but encouraged to spread their roots, whereby they may be propagated; they love a moist, light, boggy soil, in which they will thrive and flower.

KATKIN, or **CATKIN**. See **CATKIN**.

KEEL, *Carina*. See **PAPILIONACEOUS**.

KEMPFERIA, according to Linnæus a species of *Verbena*, but considered by other authors as a distinct genus.

This plant is a native of the East-Indies. The roots are divided into several fleshy tubers, which are sometimes jointed, and grow about four or five inches long. The leaves are oval, about four inches long, and two broad, without foot-stalk, growing close to the root. Between these leaves the flowers are produced singly, having no foot-stalks, but are closely embraced by the leaves; they are of a delicate white, with a bright purple bottom, but they are not succeeded by fruit in England.

Culture of the KEMPFERIA.

It is propagated by parting the roots, and the best time for this is in spring, just before they begin to put out their leaves. They should be planted in pots filled with light rich earth, and plunged into a bark-stove, where they must always remain. The leaves decay in autumn, and care should be taken not to give them too much water while they are in this inactive state.

KETMIA, a species of *Hibiscus*. See **HIBISCUS**.

KIDNEY-Bean. See **Kidney-BEAN**.

KIGGELARIA, a genus of plants, which has no English name, and only one known species.

It is a native of the Cape of Good Hope, where it rises to a middling stature. The branches are covered with a smooth bark, which is at first green, but afterwards changes to a purplish colour. The leaves are about three inches long, and one broad, of a light green, sawed on their edges, and stand upon short foot-stalks alternately. The flowers appear in clusters from the sides of the branches, hanging downward: they are

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of an herbaceous white colour. The male flowers fall away as soon as their farina is shed; but the female flowers are succeeded by globular fruit, about the size of a common red cherry, with a rough cover of a thick consistence, opening in four parts at the top, to each of which adhere many small angular seeds.

Culture of the KIGGELARIA.

This plant is propagated by cuttings. In May, just before the plants begin to shoot, these should be set in pots, and plunged into a very moderate hot-bed, covering them close with a glass to exclude the air, and always observe to shade them from the noon sun, and they should have a little water after planting.

When they begin to get strength, they should be removed each into a separate small pot, and shaded till they have taken fresh root, after which they may be exposed to the air in a sheltered situation till August, when they must be removed into the green-house, and treated in the manner of other green-house plants.

KING'S SPEAR, *Asphodelus*. See the article **ASPHODELUS**.

KITCHEN-GARDEN, a piece of ground laid out for the cultivation of fruit, herbs, pulse, and other vegetables used in the kitchen. See the article **GARDEN**.



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LABIATED, is a term applied to such flowers as have lips; or a labiated flower is an irregular monopetalous flower, divided into two lips.

LABURNUM, a species of *Cytisus*. See the article **CYTISUS**.

LABYRINTH, a winding, mazy walk between hedges, through a wood or wilderness. The chief aim is to make the walks so perplexed and intricate, that a person may lose himself in them, and meet with as great a number of disappointments as possible. They are rarely to be met with, except in great and noble gardens, as Versailles, Hampton-court, &c.

There are two ways of making them; the first is with single hedges: this method has been practised in England: and these may, indeed, be best, where there is but a small spot of ground allowed for making them: but where there is ground enough, the double is most eligible. Those made with double hedges, with a considerable thickness of wood between them, are esteemed much better than single ones; this is the manner of making them in France and other places: of all which that of Versailles is allowed to be the noblest of its kind in the world. It is an error to make them too narrow, for that makes it necessary to keep the hedges close clipped: but if according to the foreign practice, they are made wider, they will not stand in need of it. The walks are made with gravel, usually set with Hornbeams: the palisades ought to be ten, twelve, or fourteen feet high: the Hornbeam should be kept cut, and the walks rolled.

LADIES MANTLE, *Alchemilla*, a genus of plants, ranged by Linnæus among the *tetrandria monogynia*, and of which there are three species. 1. Ladies Mantle, with lobated leaves; or the common Ladies Mantle. 2. Ladies Mantle, with finger-shaped, sawed leaves. 3. Ladies Mantle, with five smooth leaves, growing at a joint, and cut into many segments.

These plants have perennial roots, and annual stalks. The first grows naturally in pasture-lands in this, and in most other countries in Europe. The second is a native of the mountainous parts of Europe; and the third grows naturally in Sweden, Lapland, and other cold countries.

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Culture of the Ladies MANTLE.

These plants are easily propagated by parting of their roots, or sowing their seeds in autumn. They should have a moist soil, and a shady situation, and be kept clean from weeds, which is all the culture they require.

LADIES-FINGER, or KIDNEY-VETCH, *Anthyllis*, a genus of plants, ranged by Linnæus among the *diadelphia decandria*, and of which there are nine species.

1. Herbaceous Ladies-finger, with leaves four times winged, and flowers growing from the sides of the stalks. 2. Herbaceous Ladies-finger, with unequal winged leaves, and double heads. 3. Herbaceous Ladies-finger, with equal winged leaves, terminated by heads of flowers. 4. Herbaceous Ladies-finger, with unequal winged leaves, and single heads of flowers. 5. Herbaceous Ladies-finger, with leaves divided into three parts, and prismatic cups growing in bunches, and of the length of the pods. 6. Shrubby Ladies-finger, with equal winged leaves, and flowers growing in heads. 7. Shrubby Ladies-finger, with unequal leaves, growing three at a joint, and downy cups growing from the sides. 8. Shrubby Ladies-finger, with sessile leaves, growing three at a joint, and naked cups. 9. Shrubby prickly Ladies-finger, with simple leaves.

The first, fourth, and fifth species are annual plants, and natives of Italy, Sicily, and Spain. The second species grows naturally in the north parts of Europe; and the third is a native of France and Switzerland; they are both perennial plants. The sixth is also a native of Switzerland. The seventh and ninth are natives of Spain, and the eighth grows naturally in Greece.

The three first species are propagated by seeds, which should be sown in April upon a bed of light earth. When the plants come up, they should be thinned to the distance of two feet, and kept clean from weeds, which is all the culture they require.

The second and third species are also propagated by seeds, which should be sown either in autumn or spring. When the plants are come up, let them be kept clean from weeds, thinned where they grow too close, and in autumn transplanted to the places in which they are to remain.

The sixth, seventh, eighth, and ninth species are propagated either by seeds or cuttings. The seeds should be sown in autumn, in pots filled with light earth, and placed under a frame in winter to screen them from the frost. When the plants will bear it, they should be transplanted each into a small pot, filled as the former, and placed in the shade till they have taken new root; after which they may be treated like other hardy exotics till October, when they must be taken into shelter.

The cuttings may be planted during any of the summer months, and watered and shaded till they have taken root; after which they may be planted in pots, and treated like the seedling plants.

LADIES SLIPPER, *Cypripedium*, a genus of plants ranged by Linnæus among the *gynandria diandria*, and of which there are three species; the culture of the following will be a sufficient direction for that of the other two; *viz.* Fibrous-rooted Ladies Slipper, with oval, and spear-pointed leaves growing on the stalk. This plant is a native of England, and several other parts of Europe. The root is irregular, oblong, and creeps beneath the surface: it is of a blackish colour, and hung with innumerable fibres; marked on the surface with the impressions of decayed stalks, and swollen at the extremities with buds of new ones. The leaves are oblong, broad, and firm. Their colour is an elegant green, and they have high ribs running lengthways. The stalk is ten inches high, round, upright, and of a pale green, often stained with red at the base. The leaves on this are like those from the root, a little hairy, as is also the stalk. In its wild state the plant usually produces only a single flower, which terminates the stalk, but in gardens, and where nature greatly favours it elsewhere, there will be two. One always terminating the stalk; the other rising from the bosom of the leaf next under it, on a long tender foot-stalk. These

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are large, and in colour partly yellow, and partly purple: the slipper as it is called being yellow; the rest tinged with crimson, but these colours are not certain, white often getting in among them, and sometimes the purple or crimson becoming universal. What has been first described, as it is the most natural, is also the most elegant state of the plant. This flower, in place of a cup, has that kind of defence called the spatha or scabbard: the flower itself is composed of four petals and its singular nectarium: this is the piece called the slipper, and as it is the most peculiar, is also the largest part of the flower. The petals are long, narrow, and placed in form of a cross: the upper and under ones are longer than those placed sideways: the two side petals are hairy on the inside, which gives it a velvety hue, and adds greatly to the beauty of the flower. From the base of the lowest petal rises the nectarium or slipper; this is of the shape and bigness of a pigeon's egg; tender, membranaceous, and hollow. The colour is naturally a pale yellow, but with good culture it will glow perfect gold; and on the under side it is marked with a few long veins of purple, but tinged a little with crimson. This is all the red natural to the slipper part; but sometimes from the luxuriance of nature, or of ill directed culture it spreads over the whole. The slipper is rounded and obtuse at the end; and toward the base it has an opening which shews it somewhat hairy within. This gives it the air of a coarse slipper, or rather of a wooden shoe. The opening is defended by a kind of lip, doubled, and very singular. The upper part is white, sprinkled with purple spots; the under thicker, greenish, and spotted at the sides with black. The filaments are only two, and they are very minute; but they are sufficiently conspicuous from their upright buttons. These are defended by the upper lip of the nectarium or slipper; but, that raised a little, they become very obvious. The rudiment of the fruit is long and twisted, and its style very short, and fixed to the upper lip of the nectarium, terminated by a faint stigma.

Culture of the LADIES SLIPPER.

This plant is propagated either by seeds or parting the roots. The seeds must be saved from the strongest plants and sown in the following compost.

Mix equal parts of earth from a rich upland pasture; river-mud, and the mellow soil from under an old wood-pile; to a load of this add a bushel of sand; and dig in a good quantity of fallen Beech-leaves, the sweepings of a garden.

Throw up this into a heap, and let it lie all winter and a great part of the succeeding summer; turning it often, and sprinkling the heap with water. Thus all will rot mellow, and mix perfectly together.

Let a piece of ground be dug up facing the south-west, well-shaded and among trees; take out the mould a spades depth and lay the compost in its place. Draw lines lengthways and across at a foot distance; and in the centre of each square open a hole, and plant one root with its ball of earth.

When these are in, scatter the seeds upon the surface; and cover all one inch deep with fallen Beech leaves. The roots in general will live, and a good part of them will flower; but these will by degrees grow weaker and decay. A great quantity of seeds will produce but a few plants, but these will be lasting; they must be left standing where they rise. The whole care of the plant is this: all spring they must be kept clear from weeds, between them must be covered with beech leaves. As they shoot leaves or stalks they must be frequently watered; and at the approach of winter the whole bed must be covered with leaves again. In this manner tho' the transplanted roots by degrees decay, the seedlings will flourish lastingly.

LADIES SMOCK, or CUCKOW FLOWER, *Cardamine*, a genus of plants ranged by Linnæus among the *tetradynamia filiquosa*, and of which there are fifteen species; as almost all of them are natives of this country, and not above one or two ever admitted into gardens, it will be unnecessary to describe more than the Double

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Double Ladies Smock, which is a beautiful variety of the **Common Ladies Smock** of our meadows.

The root is thick and furnished with innumerable long fibres. The stalk is round, upright, and a foot or more in height, reddish at the bottom, and of a dark green upwards. The leaves are long and pinnated; their colour is a fresh and lively green; and the pinnæ are oblong, narrow, pointed, and of a tender substance, their footstalks are often reddish, and the main stalk tinged with the same colour where they are inserted. The flowers are of the breadth of a shilling, swelling into roundness from a small base, and formed in the manner of a double rose, of innumerable petals placed in several series; these are narrow at their base, broader to the extremity, and there frequently waved and curled along the edge. Their colour is snow-white, and in this state they make a very delicate appearance. The fruit or seed-vessel is a pod. In the single and natural state of the plant, the flower is composed of four petals, placed cross-ways; and has a cup formed of four oval leaves. The petals have very slender bottoms, longer than the leaves of the cup. The filaments in the centre of the flower are six; and of those four are longer, and two shorter: they have all oblong, little, and heart-like buttons. The rudiment of the pod supports the stigma without any intermediate style; and the pod which follows is slender, and formed of two valves, which separate when it is ripe, and roll back. The seeds are roundish.

Culture of the Double LADIES SMOCK.

This is one of the hardy plants which bear all seasons in our open borders, and require little care or culture: but unless a peculiar place be chosen for it, the plant will pine, and the flowers never have half their natural beauty.

The gardener must therefore fix upon a low part of the garden, where wet naturally lodges, and where there is not too much sun. Then let him dig out the mould, and put in its place a compost made of rich black meadow earth, and one fourth part of dung, from an old Melon-bed; with this let him mix a small quantity of coarse sand.

In autumn let him part the roots of this plant gathered wild, if there be any double ones near; if not, let him procure some roots parted from another stock: let these be planted at ten inches distance, and covered one inch with the mould. Nothing more need be done than keeping the ground clear from weeds. The plant will flower early the succeeding year, and increase abundantly.

LANIGEROUS PLANTS, such as bear a woolly or downy substance.

LANTANA, the name of botanists, for a plant, called in English the American Viburnum; ranged by Linnæus among the *didynamia angiospermia*, and of which there are seven species. 1. Lantana with branched and naked stalks, leaves placed opposite, and flowers in umbellated heads, or Scarlet Lantana, commonly called Camara. 2. Lantana with leaves placed by threes round the stalk, and oblong imbricated spikes. 3. Lantana with leaves placed opposite, a smooth stalk, and oblong spikes. 4. Lantana with leaves placed opposite, a branching prickly stalk, and umbellated flowers growing on heads. 5. Lantana with alternate leaves, and oblong spikes. 6. Lantana with alternate leaves, and flowers growing in bunches. 7. Lantana with alternate sessile leaves, and flowers growing singly.

The six first species are shrubby plants, and natives of South America, and the seventh of the Cape of Good Hope. Among these, none merits our attention so much as the first species.

It is a handsome shrub of four feet high, and sometimes more. The root is covered with a whitish bark, and hung about with fibres. The main stem has a rough, greyish, brown bark, and is irregular in shape. The young shoots are tender, downy, angulated, and often reddish. The leaves please the eye both by their form and disposition. They are broad at the base, serrated at the edges, sharp-pointed, rough on the surface, of an

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agreeable pale green, and hairy; they stand in pairs, and have slender reddish foot-stalks. The flowers terminate all the branches in great rounded tufts, and they are naturally of a very elegant scarlet, but sometimes, in the same tuft, we see some of them of this fine and elegant red, others orange-coloured, some of a fleshy hue, some a pale yellow, and others whitish.

Each flower is formed of a single petal; this is small and tubular at the base, and spreads at the rim into four broad segments. The cup in which the flower stands is very short, of a tubular form, and lightly dented in four places. The fruit is of the berry kind, but dry: it is roundish in shape, and contains a single stone, in which are two kernels lodged in separate cells.

Culture of the LANTANA.

All the species may be propagated either by cuttings or seeds, except the second, which being an annual plant, must always be raised from seeds.

The seeds should be sown in pots filled with light earth, and plunged into a hot-bed of tan; if the plants do not come up the same year, the pots should be placed in the stove in winter, and the following spring plunged into a new hot-bed.

When the plants are fit to be removed, each should be planted in a small pot, and plunged into another hot-bed, observing to keep them shaded till they have taken new root; after which they should have air admitted to them, in proportion to the warmth of the season, and treated as other tender exotics till they have acquired strength: then remove them into an airy glass-case, or a dry stove, for the first year; but after that they may be placed abroad in the warmest part of the summer, and in winter upon stands in the dry stove.

If they are propagated by cuttings it should be done in July; the cuttings should be planted in small pots, filled with light earth, plunged in a moderate hot-bed, and screened from the violence of the sun in the middle of the day. When they have taken root they may be gradually inured to the open air, and afterwards treated as the seedling plants.

The seventh species is not so tender as the rest, and may therefore be preserved in a good green-house in the winter, and in the summer it may be exposed to the open air with other green-house plants, in a sheltered situation.

LARCH-TREE, *Larix*, according to Linnæus a species of the Pine-tree, but by other authors considered as a distinct genus, of which there are two species. 1. Larch-tree, with deciduous leaves, and oval, obtuse cones. 2. Cedar of Libanus.

The first species grows naturally upon the Alps and Appennines. It is a tree of quick growth, and rises to the height of fifty feet or more. The branches are slender and their ends generally hang downward; the leaves are long, narrow, arise in clusters from one point, and spread open like a painters brush: they are of a light green, and fall off in autumn. In the month of April the male flowers appear, which are disposed in form of small cones. The female flowers are collected into oval obtuse cones, which in some varieties have bright purple tops, and in others white. The cones are about an inch long, obtuse at their points: the scales are smooth, and lie over each other; under each scale there is usually lodged two seeds, which have wings.

There are two varieties of this tree: one of them is a native of America, and the other of Siberia. These differ from the common Larch-tree in their shoots and leaves. The American, or Black Larch, thrives very well in several gardens in England, but the latter requires a colder climate, for they often die here in summer, especially if they are planted on a dry soil. This sort will often push out leaves by the end of February: and if there happens frost later in the year, the shoots are frequently killed, and their leaves drop off, so that they are frequently naked till June, when the trees put out fresh shoots. The cones of this sort are in general larger than those of the common kind.

For the description and culture of the second species, see the article **CEDAR of LIBANUS**.

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Culture of the LARCH-TREE.

These trees are raised from seeds, which most years ripen well in England. The cones should be gathered about the end of November, and kept in a dry place till the spring, when they should be spread on a cloth and exposed to the sun, or laid before the fire, which will cause the cones to open and emit their seeds. These seeds should be sown on a border exposed to the east, where the morning sun only comes on it; or if they are sown on a bed more exposed to the sun, they should be screened with mats in the middle of the day; for when the plants first appear above ground, they are very impatient of heat: and when the bed is much exposed to the sun, the surface of the ground will dry so fast, as to require water frequently, which often rots the tender roots of the plants.

When the young plants come up they must be kept clean from weeds, and if they have made good progress they may be transplanted the following autumn, otherwise they may remain in the seed-bed another year, especially if the plants are not too close together. When they are transplanted it should be performed in the autumn, as soon as their leaves appear: and they may be planted in beds at about six inches asunder each way, which will be distance enough for the growth of the plants the two following years, by which time they will be fit to transplant where they are to remain.

When the young trees are planted out for good, they need not be set at more than eight or ten feet asunder, always planting them closer on exposed situations than where they are more defended. After the trees are planted they will require no other care but to keep them clean from weeds for three or four years, till they have obtained strength. The ground between these trees should not be dug, for it otherwise stops their growth.

LARKSPUR, *Delphinium*, a genus of plants, ranged by Linnæus among the *polyandria trigynia*, and of which there are six species. 1. Larkspur, with a one leafed nectarium, and a divided stalk; or the Field Royal Consound. 2. Larkspur, with a one leafed nectarium, and a single stalk. 3. Larkspur, with a two-leafed nectarium, a single seed-vessel, and leaves divided into many obtuse segments. 4. Larkspur, with a two-leafed nectarium, an intire lip, flowers growing singly, and compound leaves divided into many narrow parts. 5. Larkspur, with a two-leafed nectarium, a bifid lip, bearded at the top, cut leaves, and an erect stalk. 6. Larkspur, with a two-leafed cup, and palmated leaves, with intire lobes.

The first and second species are annual plants. The first is a native of most parts of Europe, and consists of a great many varieties, which the gardeners distinguish into the branched, and the upright, or unbranched Larkspur. This and the second species are great ornaments to the borders of a flower-garden.

The third species grows naturally in Italy and Sicily. The fourth and fifth species are natives of Siberia, and have perennial roots. The sixth species grows naturally in the Levant, and in some parts of Spain.

Culture of the LARKSPUR.

The first and second sorts are propagated by seeds, which should be sown where the plants are designed to remain. Those seeds which are sown in autumn produce the strongest plants, and the most double flowers, and ripen their seeds better than such as are sown in the spring. The plants require no other culture but to be thinned to a proper distance, and kept clean from weeds; but when they begin to flower they should be supported by sticks, to prevent their being broken by the wind, especially if they are not in a sheltered situation.

The third species is an annual plant, but having little beauty, is only preserved in the gardens of the curious for the sake of variety. The fourth and fifth sort are propagated by seeds, which should be sown in autumn: and the autumn following the plants should be transplanted to the places where they are designed to remain. The summer afterwards they will flower, and their roots will continue many years, and produce great numbers of

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flower-stalks. The sixth species may be propagated like the first and second sort.

LAVATERA, a genus of plants, for which there is no English name; ranged by Linnæus among the *monadelphia polyandria*, and of which there are eight species. 1. Lavatera, with a tree-like stalk, woolly, plaited leaves, having seven angles, and foot-stalks, with single flowers rising in clusters from the wings of the leaves; commonly called Tree Mallow. 2. Lavatera, with a tree-like stalk, woolly, plaited, crenated leaves, with seven acute angles, and long bunches of flowers, terminating the stalks. 3. Lavatera, with a shrubby stalk, and leaves furnished with five arrow-pointed lobes. 4. Lavatera, with a shrubby stalk, heart-shaped leaves, furnished with three round, indented, crenated lobes, heart-shaped stipulæ, and foot-stalks with single flowers. 5. Lavatera, with a shrubby stalk, woolly, plaited leaves, with seven angles, and long bunches of flowers terminating the stalks. 6. Lavatera, with an herbaceous stalk, naked fruit, and a cut cup. 7. Lavatera, with an erect stalk, the lower branches diffuse, foot-stalks growing in clusters at the wings of the stalks, and each sustaining a single flower. 8. Lavatera, with smooth leaves, a rough herbaceous stalk, one flower upon a foot-stalk, and an orbicular, closed fruit.

All these species are natives of Europe, and are very ornamental plants in gardens.

Culture of the LAVATERA.

The five first species are easily propagated by seeds, which should be sown in spring upon a bed of light earth; and when the plants are about three or four inches high, they should be transplanted to the places where they are designed to remain.

If the seeds are suffered to scatter on the ground, the plants will come the following spring; and when they happen to fall into dry rubbish, they will produce a greater number of flowers than those that are more luxuriant.

The sixth, seventh, and eighth species are also propagated by seeds; these should be sown in March upon a bed of light fresh earth. When the plants are come up, let them be cleared from weeds, and in very dry weather refreshed with water; when they are about two inches high, they should be transplanted to the places in which they are designed to remain. In doing this, care should be taken to preserve a ball of earth to their roots: and they should be watered and shaded till they have taken new root, after which they will require no other care but to keep them clean from weeds, and support them by stakes, to prevent their being injured by the winds.

The seeds of these plants may also be sown in autumn, and when the plants are come up, let them be removed into small pots, which toward the end of October, should be placed in a common hot-bed frame, where the plants being defended from severe frosts, will abide the winter very well. In the spring they may be shaken out of the pots and planted into larger ones, or else into the full ground, where they may remain to flower. By this management the plants will be larger, and flower stronger and earlier than those sown in the spring.

When the eighth species is sown in the spring, it should be in the place where the plants are to remain, for they do not bear well to be removed in the summer.

LAVENDER, *Lavendula*, a genus of plants, ranged by Linnæus among the *didynamia gymnospermia*, and of which there are four species. 1. Broad leaved Lavender. 2. Narrow-leaved Lavender. 3. Cut-leaved Lavender. 4. Lavender, with a longer, narrower, and more elegant cut leaf.

The first sort is cultivated in several of the English gardens, and has been generally known by the title of Spike, or Lavender Spike; the leaves of this sort are much shorter, and broader than those of the common Lavender; the branches are shorter, more compact, and fuller of leaves. This sort doth not often produce flowers, but when it does the flower-stalks are garnished with leaves very different from those of the other branches, approaching nearer to those of the common sort, but are broader;

broad; the stalks grow taller, the spikes of flowers are larger, the flowers are smaller, and are in looser spikes.

The second sort is the common Lavender, which is so well known as to require no description. Both these sorts flower in July, at which time the spikes of the second sort are gathered for use; there is a variety of this with white flowers.

The third sort grows naturally in Andalusia; this is an annual plant, which rises with an upright branching stalk, near three feet high; the stalks are woolly, garnished with hoary leaves growing opposite, which are cut into many divisions to the mid-rib; these segments are again divided on their borders toward the top, into three obtuse segments, so that they end in many points. The foot-stalk of the flower is naked, having four corners or angles, and is terminated by a close spike of flowers, about one inch long: the spike has the rows of flowers twisted spirally; under this spike there are commonly two small ones proceeding from the side of the stalk, at about an inch distance from the middle spike. There are two varieties of this, one with blue, and the other with white flowers.

The fourth sort grows naturally in the Canary Islands. This rises with an upright branching square stalk, four feet high, garnished with leaves, are longer, and cut into narrower segments than those of the third sort. They are of a lighter green, and hairy: the naked flower-stalk is also longer, and terminated with a cluster of spikes of blue flowers. The flowers are smaller than those of the common Lavender, but are of the same shape.

Culture of LAVENDER.

The two first species are propagated by slips, the best season for which is in March; they should be planted in a shady situation, or at least shaded with mats until they have taken root: after which they may be exposed to the sun, and when they have obtained strength, may be removed to the place where they are designed to remain. The plants will live the longest in a dry, gravelly, or stony soil, in which they will endure our severest winters: though they will grow much faster in the summer, if they are planted upon a rich, light, moist soil, but then they are generally destroyed in winter, nor are the plants half so strong scented. The third sort is sown every spring on borders or beds, and when the plants come up, they may be transplanted into other borders of the flower-garden, or into pots, where they are designed to flower, and will require no farther care but to keep them clean from weeds. If the seeds of this sort are permitted to scatter, the plants will come up the following spring without care, and may be treated in the manner before directed. The fourth species is tenderer than either of the former, so the seeds must be sown on a moderate hot-bed in the spring; and when the plants are fit to remove, they should be each planted into a separate small pot, and plunged into another hot-bed, to bring the plants forward; in the beginning of June they should be inured to the open air, in which they should be placed in a sheltered situation; in July the plants will flower, and if the autumn proves warm, the seeds will ripen in September; but when they do not perfect seeds in the open air, the plants may be removed into a glass-case, where the seeds will ripen.

LAVENDER-COTTON, *Santolina*, a genus of plants, ranged by Linnæus among the *syngenesia polygamia æqualis*, and of which there are eleven species. 1. Lavender-cotton, with one flower upon a foot-stalk, and leaves indented four ways; or common Lavender-cotton. 2. Lavender-cotton, with one flower upon a foot-stalk, globular empalements, and woolly leaves, which are indented four ways. 3. Lavender-cotton, with one flower upon a foot-stalk, declining stalks, and linear leaves, which are four ways indented. 4. Lavender-cotton, with one flower upon a foot-stalk, and very long linear leaves, which are two ways indented. 5. Lavender-cotton, with one flower upon a foot-stalk, globular heads, and linear, entire leaves. 6. Lavender-cotton, with one flower upon a foot-stalk, and linear obtuse leaves growing in clusters. 7. Lavender-cotton, with

one flower upon a foot-stalk, and longer woolly leaves, which are twice indented. 8. Lavender-cotton, with single corymbuses of flowers, which are close together at the top, and wing-pointed indented leaves. 9. Lavender-cotton, with single corymbuses of flowers, which are closed together at the top, and leaves having three wedge-shaped lobes. 10. Lavender-cotton, with single corymbuses, which are closed together at the top, and linear leaves half divided into three points. 11. Lavender-cotton, with compound corymbuses, which are closed together at the top, the under leaves linear, and indented, and the upper oval, and sawed.

The first species grows naturally in Spain, Italy, and other warm parts of Europe. It has a ligneous stalk, dividing into many branches. The leaves are slender, hoary, four ways indented, and have a rank strong odour when handled. The branches are terminated by a single flower, composed of many hermaphrodite florets, which are fistular, cut into five parts at the top, of a sulphur colour, and are included in one common empalement, having no borders or rays. These are succeeded by small, oblong, striated seeds, which are separated by scaly chaff, and ripen in the empalement.

The second species is a native of Spain. It has a shrubby stalk, which branches out like the former, but the plants seldom grow so tall. The leaves are shaped like those of the other sort, but shorter, thicker, and whiter. The flowers are much larger, and the brims of the florets are more reflexed; they are of a deeper sulphur colour than the other.

The third species is of lower stature than either of the former, seldom rising more than fifteen or sixteen inches high. The branches spread horizontally near the ground. The leaves are shorter than either of the former, hoary, and finely indented. The stalks are terminated by single flowers, of a bright yellow colour, which are larger than those of the first sort.

The fourth sort rises higher than either of the former, the branches are more diffused, slender, and smooth. The leaves are long, very narrow, of a deep green, and two ways indented. The stalks are slender, naked toward the top, and terminated by single flowers of a gold colour.

The fifth species has shrubby stalks, which rise three feet high, sending out long, slender branches. The leaves are single, linear, and of a pale green. The stalks are terminated by large, single, globular flowers, of a pale sulphur colour.

The sixth species has some resemblance of the fifth, but the branches are shorter and thicker. The leaves come out in clusters. The flower-stalks are sparsely disposed, and have leaves to their tops, the flowers are small and of a yellow colour.

The seventh species has shrubby stalks, which rise three feet high. The leaves are broader than either of the former. The stalks divide at the top into two or three foot-stalks, each sustaining one large sulphur-coloured flower.

The eighth species is an annual plant, which grows naturally in the Mediterranean. It rises with herbaceous, slender stalks, one foot high; they are hoary, sending out branches, which diminish in their length to the top of it. The leaves grow in clusters, and are wing-pointed. The branches are terminated by clusters of flowers, of a bright yellow colour.

The ninth species is a native of the Cape of Good Hope. It rises with a shrubby stalk five or six feet high, sending out many slender branches. The leaves are short, flat, cut into three parts at the top, of a grey colour, and sit close to the branches. The flowers are disposed in a single corymbus at the ends of the branches, and are very closely connected together; they are of a pale sulphur colour, and have roundish, scaly empalements.

The tenth species is a native of the same place. It has a shrubby stalk very like the former, but the leaves of this are linear, cut half their length into three points, and sometimes into five. The flowers resemble those of the former sort.

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The eleventh species is also a native of the Cape of Good Hope. It has a low shrubby stalk, dividing into several branches. The leaves are of two sorts: those on the lower part are oblong, and cut on their edges into acute points, and those on the upper are short, stiff, and slightly indented at their ends. The flowers are disposed in a compound corymbus at the ends of the branches, and are of a pale yellow colour.

Culture of LAVENDER-COTTON.

The seven species first mentioned are hardy plants, and easily propagated by planting slips or cuttings during the spring, in a border of light fresh earth. If the season is very hot and dry, they must be watered and shaded till they have taken root, after which they will require no farther care but to keep them clean from weeds till autumn, when they should be transplanted where they are designed to remain. But if the ground is not ready at that time to receive them, it will be proper to let them remain in the border till spring; for if they are transplanted late in autumn, they are liable to be destroyed by cold in winter.

The eighth species is an annual plant, and propagated only by seeds, which must be sown the latter end of March upon a moderate hot-bed, and when the plants appear, they should be treated like other hardy annuals. The latter end of May they should be transplanted into a warm border of light earth, where they will flower, and in warm seasons perfect their seeds.

All the other species are too tender to live through the winter, in the open air in England. They are easily propagated by planting cuttings in pots any time in summer, observing to shade and water them till they have taken root: after which they only require to be kept clean from weeds. In autumn they must be removed into the green-house, where they should have a large share of air admitted to them in warm weather, as they only require protection from hard frost: for if they are too tenderly treated, their branches grow weak and unsightly.

See LAVENDER, *Limonium*, a genus of plants, of which there are eleven species. 1. Common great Sea Lavender. 2. Sea Lavender, with oblong, oval leaves, a spreading paniculated stalk, and shorter spikes of flowers. 3. Sea Lavender, with oval, obtuse leaves, running foot-stalks, a paniculated stalk, and more upright spikes of flowers. 4. Sea Lavender, with spear-shaped leaves, a low spreading stalk, and slender spikes of flowers. 5. Sea Lavender, with narrow, spear-shaped leaves, a branching, spreading stalk, and flowers ranged thinly on one side the stalk. 6. Sea Lavender, with the lower leaves alternately situated like wings: those upon the stalks three cornered, awl-shaped, and running along the foot-stalk. 7. Sea Lavender, with a spreading shrubby stalk, narrow, thick, spear-shaped leaves, and flowers growing singly, at a distance from each other. 8. Sea Lavender, with wedge-shaped leaves, an upright, paniculated stalk, and the under branches sterile and naked. 9. Sea Lavender, with a paniculated, naked stalk, and spatula-shaped, blunt leaves. 10. Sea Lavender, with a naked, taper, paniculated stalk, and leaves set with tubercles. 11. Sea Lavender, with an upright, shrubby stalk, narrow, spear-shaped leaves, ending in obtuse points, and flowers ranged alternately.

The first species is a native of this country. The roots are thick, of a reddish colour, with many strong fibres, from which come out several oval, spear-shaped, smooth leaves, of a thick consistence. The stalk is naked, and rises upwards of a foot high, divided into many small branches at the top, and terminated by slender spikes of pale blue flowers.

The second species grows naturally in the south of France, on the sea-coast. The stalk rises fifteen or sixteen inches high, dividing into several spreading branches. The leaves are of an oblong, oval form, smooth, entire, and of a deep green. The stalks are terminated by short spikes of pale blue flowers. This sort never produces good seeds here.

The third species is a native of Narbonne and Provence. It has small, oval, obtuse leaves, standing

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on long foot-stalks. The stem rises a foot and a half high, sending out branches alternately on each side, so as to form a loose kind of pyramid, and are terminated by spikes of pale blue flowers, which are erect.

The fourth species is a native of England. The leaves are spear-shaped, about three inches long, and one broad in the middle, lessening gradually to both ends. The stalk rises four or five inches high, dividing into many spreading branches, which are very thick, set with short spikes of pale blue flowers.

The fifth species is a native of the Levant. The leaves are about four inches long, and three quarters of an inch broad in the middle, diminishing gradually to both ends. The stalks are about five or six inches high, dividing into several spreading branches, which are terminated by short spikes of pale blue flowers. This sort flowers late in August, so never ripens seeds here.

The sixth species grows naturally in Sicily and Palestine. The lower leaves, which spread on the ground, are indented almost to the middle rib: these indentures are alternate and blunt. The stalks rise a foot and a half high, dividing upwards into several branches; at each joint appear three narrow leaves, sitting close to the stalks, from whose base proceeds a leafy membrane, or wing, which runs along on both sides the stalk. The stalks are terminated by panicles of flowers, which sit upon winged foot-stalks, each sustaining three or four flowers, of a light blue colour, which continue long without fading. This is a biennial plant.

The seventh species is a native of Sicily. It has a shrubby stalk, which rises about two feet high, dividing into several ligneous branches, which spread out on every side. The leaves are grey, and of a thick consistence. The branches are terminated by panicles of blue flowers, which come out singly at a distance from each other, having long tubes, but divide into five segments upward, which spread open.

The eighth species is a native of Sicily, and has also been found growing naturally in Norfolk. The lower leaves are narrow at their base, but enlarge upwards, and are rounded at the top in the shape of a wedge. The stalks are slender and stiff, rising from seven to fourteen inches high, sending out many slender side branches; all those which proceed from the lower part of the stalk are barren, having no flowers, but toward the top they have short panicles of whitish flowers, which are small, and sit three or four together upon one foot-stalk.

The ninth species grows naturally near the sea, about Marseilles and Leghorn. It has many thick, fleshy leaves, which are shaped like a spatula, growing near the root, which are smooth, of a greyish colour, and spread on the ground. The stalks are naked, and rise about six inches high, dividing towards the top into many small branches, which are terminated by short, crooked panicles of small flowers, of a pale red colour.

The tenth species grows naturally about Montpellier, and in Italy. It is an annual plant, and has long narrow leaves, which are set with rough tubercles. The stalks rise about eight inches high, dividing into two or three small branches, which are terminated by reflexed short spikes of pale blue flowers, which appear late in August, so that the seeds are seldom perfected in England.

The eleventh species is a native of Egypt. It rises with an upright shrubby stalk to the height of eight or ten feet, divided into many branches. The leaves are narrow, spear-shaped, of a thick consistence, and a grey colour. The flowers are produced at the ends of the branches in loose panicles, standing alternate on each side the stalk; they have long tubes, which enlarge upwards, where they are cut into five obtuse segments, which spread open. Their colour is a bright sky-blue, which fades to a purple before they fall off.

Culture of the Sea LAVENDER.

The first, second, third, fourth, and fifth species are abiding plants, which will thrive in the open air in England. These plants may be transplanted at almost any

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any time of the year, provided they are carefully taken up, preserving some earth to their roots.

These plants do not propagate very fast in gardens, and unless they are planted in a moist shady border, seldom flower well; the best way to have them succeed, is to keep the plants in pots, and in summer to place them in a shady situation: but in winter they may be removed to a place where they may enjoy the sun.

The seeds of the sixth, eighth, ninth, and tenth species must be sown in autumn, on a border of fresh earth, exposed to the south-east. When the plants come up they must be kept clean from weeds, and if they are too close, some of them should be carefully taken up as soon as they are fit to remove, and planted in small pots, placing them in the shade till they have taken root, after which they should be set where they may have the morning sun till autumn, when they must be put under a hot-bed frame, where they may be screened from hard frost, but enjoy the free air in mild weather.

Those plants which were left in the border, should be covered with mats in hard frost, which, otherwise, would inevitably destroy them.

The following summer the plants will flower, and some of them will ripen their seeds, but it requires a very warm dry season to bring those of the sixth and tenth sorts to perfection; for which reason it is always best to obtain them, if possible, from the places where they grow naturally.

The seventh and eleventh species are shrubby plants, which are too tender to live through winter in the open air of our climate. They are easily propagated by cuttings, which should be planted in July on a shady border, where they must be constantly watered, and in six or seven weeks they will take root, when they should be taken up and planted in pots filled with light loamy earth, placing them in the shade till they have taken root: then they may be exposed till October, at which time they must be removed into the green-house, and placed among the hardy plants, where they will continue great part of the winter, and make an agreeable variety.

Spurge LAUEL, *Daphne*. See *DAPHNE*.

LAUEOLA, a species of *Daphne*. See the article *DAPHNE*.

Cherry LAUREL. See *Cherry Laurel*.

LAURUS, Bay-tree. See the article *BAY-TREE*.

LAURUS ALEXANDRINA, a species of *Ruscus*. See *Ruscus*.

Sea-side LAURUS, or *LAUREL*, *Phyllanthus*, a genus of plants, of which there are five species. 1. *Sea-side Laurel*, with spear-shaped, sawed leaves, having flowers growing on their edges. 2. *Sea-side Laurel*, with winged leaves, bearing flowers upon foot-stalks, and an upright herbaceous stalk. 3. *Sea-side Laurel*, with winged leaves, bearing flowers, fitting close, and a trailing herbaceous stalk. 4. *Sea-side Laurel*, with winged leaves, bearing flowers, and a tree-like stalk. 5. *Sea-side Laurel*, with oval, obtuse, entire leaves.

The first species is a native of the West-Indies. It rises with a woody stalk, about fifteen or sixteen feet high. The leaves appear without any order: on their edges the flowers are produced, especially toward the upper part, where they are placed very close; these, together with the shining green of the leaves, make a very beautiful appearance. The leaves continue green all the year.

The second species is a native of both Indies. It rises with an herbaceous stalk about a foot high, it branches out, and has winged leaves, composed of many oval lobes, under which the flowers are produced upon foot-stalks, ranged along the mid-rib; they are small, of an herbaceous colour, and make no great appearance.

The stalks of the third species trail on the ground. They have winged leaves, with oblong lobes, under which the flowers are ranged along the mid-rib. This is also a native of both Indies.

The fourth species has a woody tree-like stalk, spreading into many branches, and the leaves are very narrow.

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The plants of this sort have never produced flowers in England. It is a native of the East-Indies.

The fifth species is a native of the West-Indies, where it becomes a tree of middling stature; the leaves are almost oval, of a light green on their upper side, but grey on their under, and very entire. The flowers of this sort have never appeared in England.

Culture of the Sea-side LAUREL.

The first species is very difficult to propagate: for unless the seeds are sown soon after they are ripe they will not grow, and often the greatest part of the seed proves abortive.

The seeds should be sown in pots, and when the plants come up they must be removed each into a separate pot, and in the winter placed in a moderate stove; but in summer they may be exposed to the open air, in a warm, sheltered situation.

The second and third species are annual plants. They are propagated by seeds, which must be sown in spring upon a hot-bed. When the plants come up, and are fit to remove, they should be each put into a separate small pot, and plunged into a hot-bed of tanners-bark, shading them from the sun till they have taken new root; after which they require the same management as other plants from hot countries.

They will perfect their seeds in autumn, at which time they must be carefully watched, or their husks will open, and scatter the seeds into such pots as are near them, where if the mould is not disturbed, the plants will come up the following spring.

The seeds of the fourth and fifth species must be sown in spring upon a hot-bed; when the plants come up they must be removed each into a separate pot, and plunged into a tan-bed in the summer. In winter they must be removed into the bark-stove, where they should always remain.

LAURUSTINUS, the name of two species of *Viburnum*. 1. The common *Laurustinus*. 2. *Laurustinus*, with shining leaves.

The first sort rises about five or six feet high. The leaves are about two inches and a half long, and one and a quarter broad; they are rounded at their base, but end in acute points, veined, and hairy on their under side, and of a lucid green on their upper. The flowers appear in autumn, and continue all the winter.

The second sort rises higher, and the branches are stronger than those of the former. The bark is smoother; the leaves are larger, of a thicker consistence, and of a lucid green colour. The flowers are larger, and seldom appear till spring.

Culture of the LAURUSTINUS.

Both these sorts are propagated by laying down their young branches, which put out roots very freely: so that when they are laid in autumn, they will be sufficiently rooted by that time twelvemonth, to be taken off from the old plants, when they may be either planted where they are to remain, or into a nursery, where they may stand two years.

The best time for transplanting these is at Michaelmas, that they may get new root before winter; though they may be removed in spring, with balls of earth to their roots, provided it is done before they begin to shoot.

These plants may also be propagated by seeds, which should be mixed with earth in autumn, soon after they are ripe; these should be exposed to the open air, and receive the rain in winter: and in the spring they may be sown upon a gentle hot-bed, which will bring up the plants; they may remain in the bed till autumn, and then may be transplanted and treated in the same way as the layers.

LAWN, a spacious plain in a park, or adjoining to a noble seat. As to the dimensions of a lawn, in a large park, it should be as extensive as the ground will permit, and, if possible, it should be less than fifty acres: but in gardens of a moderate extent, a lawn of ten acres is sufficient, and in those of the largest size fifteen acres. The best situation for a lawn, is in the front of the house: and here, if the house front the east, it will be

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extremely convenient: but the most desirable aspect for a Lawn, is that of the south-east. As to the figure of the Lawn, some recommend an exact square, others an oblong square, some an oval, and others a circular figure: but neither of these are to be regarded. It ought to be so contrived as to suit the ground, as there should be trees planted for shade on the boundaries of the Lawn, so the sides may be broken by irregular plantations of trees, which, if there are not some good prospects beyond the Lawn, should bound it on every side, and be brought round pretty near to each end of the house. If in these plantations round the Lawn, the trees are placed irregularly, some breaking much forwarder on the Lawn than others, and not crowded too close together, they will make a much better appearance, and grow large, straight, handsome, and produce a fine effect. The most proper trees for this purpose, are the Elm, Oak, Chesnut, and Beech: and if there are some clumps of ever-green trees intermixed with the others, they will add to the beauty of the whole, especially in the winter season; the best sorts for this purpose, are Lord Weymouth's Pine, and the Silver and Spruce Firs.

LAWSONIA, a genus of plants, of which there are two species. 1. *Lawsonia*, or Broad-leaved Egyptian Privet. 2. *Lawsonia*, with prickly branches.

The first species grows naturally in India, Egypt, and other warm countries, where it rises with a shrubby stalk eight or ten feet high. The branches are slender, covered with a whitish yellow bark, and come out opposite. The leaves are small, oblong, ending in acute points, and of a pale green. The flowers are placed at the ends of the branches in loose bunches: they are of a dingy white, and composed of four small petals, which turn backward at the top. These are succeeded by roundish capsules, with four cells filled with angular seeds. The Arabians call this plant *Alkenna*, or *Henna*.

The second species grows naturally in both Indies. It rises with a woody trunk eighteen feet high, and sometimes more, covered with a light grey bark. The branches are placed alternate. The leaves are oblong, oval, and stand without order; at the joints where the leaves are situated, come out single, sharp thorns. The flowers are produced in loose bunches from the sides of the branches: they are of a pale yellow, and have a disagreeable scent. They are composed of three petals, which spread open; between each of these are situated two strong stamina, terminated by roundish summits. After the flowers are past, the germen becomes a roundish capsule with four cells, including many angular seeds.

Culture of the LAWSONIA.

The plants are propagated by seeds, which should be sown on a hot-bed early in the spring, that the plants may have time to get strength before winter. When they are fit to remove, they should be each planted in a small pot, and plunged into a hot-bed of tanners-bark, where they must be shaded from the sun till they have taken new root; after which their treatment should be the same as that of the Coffee-tree, with this difference only, not to keep them too warm, and to water them very sparingly, especially in the winter.

In the warmest part of summer these plants may be placed in the open air in a sheltered situation: and in autumn they must be removed into the stove.

LAYERS, in gardening, are tender twigs or shoots of trees, part of which are laid or buried in the ground, till having struck root, they are afterward separated from the parent tree, and become distinct plants. Many plants and trees are propagated by laying, when all other methods fail; and particularly those exotic trees which do not produce seeds with us. The operation is performed by flitting the branches from the middle of a joint upwards a little way (as is practised with Carnations) and laying them about half a foot in the ground; and if they are not pliable, they should be pegged down with a hook; with some plants a twist at the place intended to strike root will suffice, or by tying a piece of wire round the part, and making punctures with an awl just above the place of bandage.

If the branches intended to be layed are not within reach of the ground, then it will be necessary to make use of tubs or pots filled with proper mould, and placed on treffels, posts, or some such conveniences, to receive the branches. The season for laying down deciduous hardy trees is in October, but for such as are tender, in March, and for ever-greens, June or August are good seasons. Though layers may be laid down at any time, the before-mentioned seasons are most proper for the reasons following; because they have the whole winter and summer to prepare and draw root; for at these times of the year the sun has sufficient power on the sap of the tree to feed the leaf and bud, but has not power sufficient to make a shoot; and if that small quantity of sap that arises be hindered, as it will by some of the preceding ways of laying, the leaves and buds will draw their nourishment from the layer, and by that means will prepare the layer to take root or put forth roots a little to maintain itself, finding it cannot have a proper supply from the mother plant. The harder the wood of a tree is, the young shoots will take root the best; but if the wood is soft, the older branches will more readily root, and consequently sooner make a tree.

LEADWORT, *Plumbago*, a genus of plants, of which there are two species. 1. Leadwort, with leaves embracing the stalks. 2. Leadwort, with the leaves on foot-stalks.

The first species is a native of the southern parts of Europe; and the second grows naturally in the East and West-Indies. Both these plants have perennial roots.

Culture of the LEADWORT.

The first species is propagated by parting of the roots, at any time when the weather is mild, from the decay of the stalk in the winter till it begins to shoot in the spring. The roots should be planted in a light soil and a warm situation, allowing them room to spread when the plants appear; they must be kept clean from weeds, and the ground between them dug every winter, which is all the culture they require.

The second species is propagated by seeds, which should be sown on a good hot-bed in the spring. When the plants are fit to be removed, they should be planted each into a separate small pot, filled with light loamy earth, and plunged into a hot-bed of tan, where they must be shaded from the sun till they have taken fresh root, and afterwards treated like other tender exotics.

LEAF, *Folium*, a very essential and ornamental part of plants, whose chief office is to subtilise and give more spirit to the abundance of nourishing sap, and to convey it to the buds of the future shoots, which are always formed either at the base of the leaf, or its foot-stalk: they likewise serve to cover the flowers and fruits with their shade; and keep them from many inconveniences; they are to trees what hair is to the human body.

Botanists consider the leaves with regard to their structure, surface, shape, consistence, edges, situation, and size: with regard to their structure, they are either single, as those of the apple, pear, and plumb-tree, or compound, as those of the strawberry, parsley, &c. a single leaf is one which is either immediately joined to the branch or connected with it by a foot-stalk; a leaf is said to be compound, when there are more than one upon a petiole or foot-stalk: with respect to their surface, they are either flat, as the origany, or in bunches, as the houseleek: with regard to their shape, they are either lanceolated, cordated, acuminate, hastated, &c. and are either thin and fine, as those of the hypericum; or thick and gross, as those of purslane; or fleshy, as those of several kinds of aloes; or woolly, as those of marsh-mallows: with regard to their edges, leaves are cut slightly, as in some species of geums, or deep, as in some of the centaurs: with respect to their situation, they are either ranged alternately, as the alaternus; or opposite to each other, as the phillyrea, mint, baum, &c. with regard to their size, they are either very large, as those of the mufa; or moderate, as those of the fig and vine; or small, as those of the elm or apple tree; or very small, as those of the heath, phylica, &c.

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Many sorts of plants, whose roots issue forth from the small end of the seed, put out two small leaves that are very unlike those which the plant afterwards produceth; for as soon as the root has taken hold of the ground, between these false leaves (commonly called the seed-leaves) there comes forth a shoot which produces leaves like those of the mother plant; of this manner of growth there is an infinite number of plants.

Dr. Grew observes, that the fibres of leaves consist of two general kinds of vessels: viz. for sap and for air: and are ramified out of greater into less, as veins and arteries are in animals.

Mr. Frederick of Augsbourg, a celebrated gardener, took from the tree a leaf of the opuntia or Indian fig-tree; and setting it in the earth, it immediately took root, and produced blossoms and fruit.

The distinction of leaves, made by those who have written on botany, are the following.

A simple leaf is that which is not divided to the middle.

A compound leaf is divided into several parts, each resembling a simple leaf, as in liquorice, &c.

A digitated leaf is a compound leaf, divided into several parts, all of which meet together at the tail, as in the hemp, black hellebore, &c.

A trifoliated leaf is a digitated leaf, consisting of three fingers, as the trefoil, &c.

A quinquefoliated leaf is a digitated leaf, consisting of five fingers, as in the quinquefolium.

A pennated leaf is a compound leaf divided into several parts, each of which is called a lobe, placed along the middle rib, either alternately, or by pairs. When the middle rib is terminated by an odd lobe, it is said to be unequally pennated, as in the goats rue, &c. and equally pennated, when it is not terminated by an odd lobe, as in the cassia; when the lobes are all nearly of the same form and bigness, it is called an uniform pennated leaf, as in the liquorice; when they are not so, it is said to be difform, as in the agrimonia.

A winged leaf is, as it were, divided into several pennated leaves, as in the orobus, &c.

A ramose leaf is that which is still farther divided than the winged leaf, as in the osmund royal, female fern, &c.

An entire leaf or lobe is that which has no division on its edges, as in the apple-tree, &c.

A sinuated leaf is that which is cut about the edges into several long segments, as in common mallows.

A serrated leaf is that which is cut about the edges into several acute segments, resembling the teeth of a saw, as in the nettle, &c.

A crenated leaf is that which is cut about the edges into several obtuse segments, as in the betony, &c.

A lacinated or jagged leaf is that which is cut about the edges into several pretty deep portions, in an irregular manner, as in the horned poppy, &c.

If the surface of the leaves are altered, by reversing the branches of trees on which they grow, the plants are stopped in their growth, until the foot-stalks are turned, and the leaves recover their former position. This shews how necessary it is to support all those weak shoots of plants, which are naturally disposed for upright growth, which either twine about the neighbouring trees for support, or that put out clasps, by which they take hold of whatever trees or plants grow near them, and are thereby supported: and, on the contrary, how absurd is that practice of tying up the shoots of those plants which are naturally disposed to trail upon the ground, for in both these cases nature is reversed, and consequently the growth of both sorts of plants is greatly retarded.

This is one of the great functions for which the leaves of trees and plants are designed; but, besides this, there are others of equal importance to the well-being of plants and fruits; the first is, that of the foot-stalks and leaves nourishing, and preparing the buds of the future shoots, which are always formed at the base of those foot-stalks, and during the continuance of the leaves in perfect health, these buds increase in their

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magnitude; and, in the deciduous trees, are brought to maturity before the foot-stalks separate from the buds in autumn; but if by accident the leaves are blighted, or if the entire surface of the leaves are cut off, and the foot-stalks are left remaining, the buds will decay for want of that proper nourishment which is conveyed to them from the leaves: so that whenever trees are divested of their leaves, or those leaves are cut, or otherwise impaired, though it may in either case happen when the buds may be nearly formed, yet if it is before the foot-stalks separate naturally from their branches, the future shoots will be weakened in proportion to the time when this is done; therefore from all the experiments which have been made in order to know how serviceable the leaves of trees and plants are to their well-being, it has been found, that when the plants have been divested of their leaves, or their leaves have been eaten or cut, during their growth, the plants have been remarkably weakened thereby. This should teach us not to pull or cut off the leaves of trees, or plants, on any account while they retain their verdure, and are in health; and this shews how absurd that common practice is, of feeding down wheat in the winter and spring with sheep; for by so doing, the stalks are rendered very weak, and the ears are in proportion shorter; nor are the grains of corn so plump and well nourished, as that which is not fed down upon the same ground: this is a fact which we can assert from many years experience. It is very evident, that grass which is often mowed, the blades will be rendered finer in proportion to the frequency of mowing it, yet the species of grass is the same with that on the richest pastures; so that although this may be a desirable thing for lawns, &c. in gardens, yet where regard is had to the produce, this should be avoided.

Another principal use of the leaves, is to throw off by transpiration what is unnecessary to the growth of the plants, answering to the discharge made by sweat in animal bodies; for as plants receive and transpire much more, in equal time, than large animals, so it appears how necessary the leaves are to preserve the plants in perfect health; for it has been found by the most exact calculation, made from repeated experiments, that a plant of the sun-flower receives and perspires, in twenty-four hours, seventeen times more than a man.

We shall beg leave to mention a few, out of the many experiments which have been made by M. Bonnet, of Geneva, to prove that most leaves imbibe the moisture of the air on their under surface, and not from their upper: they are as follows:

He gathered the leaves of sixteen sorts of herbaceous plants when fully grown; of each he put several leaves upon the surface of water in glass vases, some were posited with their upper surface, and others with their under surface upon the water; these were adjusted exactly to the surface of the water, with great care not to let any moisture reach their opposite surfaces, and the same care was taken to prevent their foot-stalks from receiving any moisture. The glasses in which these leaves were thus placed, were kept in a closet, where the air was very temperate; and as the water in the glasses evaporated, there was, from time to time, a supply of fresh, which was added with a syringe, so that the leaves were not disturbed. The leaves were taken from the following plants; the plantain, the mullein, the wake Robin, the great mallow, the nettle, the marvel of Peru, the kidney-bean, the sun-flower, the cabbage, the baum, the cock's-comb, the purple-leaved amaranth, spinach, and the smaller mallow.

Six of these sorts he found continued green a long time, and these were with different surfaces upon the water: they were of the following sorts, the wake Robin, the kidney-bean, the sun-flower, the cabbage, spinach, and the small mallow: among the others, the following sorts were found to draw the moisture better with their upper than with their under surface, the plantain, the mullein, the great mallow, the nettle, the cock's-comb, and the purple amaranth.

The leaves of the nettle, whose under surfaces were placed upon the water, were decayed in three weeks; whereas

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whereas those whose upper surfaces touched the water, lasted three weeks.

The leaves of the mullein, whose under surfaces were next the water, did not continue fresh more than five or six days, whereas those whose upper surfaces were next the water, lasted five weeks.

The leaves of the purple amaranth, whose upper surfaces were next the water, continued fresh three months; whereas those whose under surfaces touched the fluid, were decayed in a week.

The leaves of the marvel of Peru and the baum, appeared to have the advantage, whose under surfaces were next the water.

The leaves of the wake Robin, and of the cock's-comb, whose foot-stalks only were put into the water, continued fresh a longer time than those which were placed with either surface upon the water.

The leaves of the great mallow, the nettle, the sun-flower, the marvel of Peru, and the spinach, whose foot-stalks were plunged into the water, continued fresh a shorter time, than those which had either of their surfaces upon the water.

The leaves of the mullein, plantain, and amaranth, which received the water at their foot-stalks, continued fresh much longer than those whose under surfaces touched the water.

It is not difficult to explain the reason of this fact; for the orifices of the sap-vessels in the foot-stalks are much larger than those of either surface, so that the water insinuates itself in greater quantities, and with more ease, in the first than by the second way.

After this the same gentleman made experiments on the leaves of sixteen sorts of trees and shrubs, of the following sorts: the lilac, the pear-tree, the vine, the aspin, the laurel, the cherry-tree, the plum tree, the horse-chestnut, the white mulberry, the lime-tree, the poplar, the apricot, the walnut, the filbert, the oak, and the creeper.

Among these species he found, that the lilac, and the aspin, imbibed the water equally with either their upper or under surface; but in all the other sorts, the under surfaces imbibed it in much greater quantities than the upper. The difference was very remarkable in the leaves of the white mulberry, for those whose upper surfaces were laid upon the water, faded in five days; whereas the others whose under surfaces were next the water, preserved their verdure near six months.

The vine, the poplar, and the walnut, afforded very remarkable instances, how little disposed the upper surfaces of the leaves of ligneous plants are to imbibe the moisture: for the leaves of these three sorts, whose upper surfaces were applied to the water, decayed almost as soon as those which had no nourishment.

In all the experiments made by this curious gentleman upon the various leaves of trees and herbs, it is remarkable that all those leaves, which imbibed their moisture by their upper surface, were such as had that surface covered over with hairs or down; and, on the contrary, where the under surface was garnished with either hairs or down, the nourishment was imbibed by that surface. He also mentions many experiments made by himself, and also by M. Duhamel de Monceau, of the Royal Academy of Sciences at Paris, in rubbing the leaves over with varnish, oil, wax and honey, to see the effect of these upon various leaves, some of which were rubbed over on both surfaces, others only upon one; some only a part of the surfaces, others the edges of the leaves were rubbed over, and in some only the foot-stalks of the leaves. They likewise anointed the trunks of some trees and shrubs, leaving the leaves and branches in their natural state.

The result of these experiments was, that where the leaves were covered with varnish on both sides, they presently decayed; and where they were anointed with other things, the leaves continued a shorter time than others, in proportion as the things were more penetrating; and where one surface only was anointed, they continued much longer than those which were anointed on both; and where the pedicle alone was anointed, they continued still longer: but the anointing of the trunks made no

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sensible alteration, except in very hot weather; when they were both of opinion that anointing them were of service, by hindering the too great transpiration, which tend to weaken the trees: for they observed that those trees which were varnished, suffered less from the violent heats, than the trees which were left in their natural state.

M. Bonnet also observed, that the tender parts of the leaves which were varnished were destroyed by it, and the tough fibres only left remaining.

We may therefore reasonably conclude, that one great use of leaves is what has been long suspected by many, viz. to perform, in some measure, the same office for the support of vegetable life, as the lungs of animals do for the support of animal life: plants, very probably, drawing through their leaves some part of their nourishment from the air. *Miller's Gard. Dict.*

LEEK, *Porrum*, according to Linnæus a species of allium; but considered by other authors as a distinct genus, of which there are two species. 1. Leek with an oblong coated root; a plain leaf on the stalk, flowers collected in heads, and three pointed stamina; commonly called London Leek. 2. Leek with a plain leaf on the stalk, which supports a globular umbel of flowers, whose stamina are longer than the petals.

The first species is commonly cultivated in our gardens; and the second is a native of Siberia.

Culture of the LEEK.

The manner of propagating them is by seeds, and they are generally sown along with onions. The onions grow first; and, after they are pulled up, the Leeks will have time enough to grow to their size.

Their culture is in every respect like that of the onion; to which, to avoid repetition, we refer the reader.

If you would save the seeds of this plant, make choice of some of the best and largest you have, which must remain in the place where they grow until February, when they should be transplanted in a row against a warm hedge, pale, or wall, at about eight inches asunder; and, when their stems advance, they should be supported by a string, to prevent their being broken down, to which accident they are very liable, especially when in head. The closer they are drawn to the fence in autumn, the better the seeds will ripen; for it sometimes happens in cold summers or autumns, that those which grow in the open garden do not perfect their seeds in this country, especially if there should be sharp frosts early in autumn, which will entirely spoil the seed.

When it is ripe, which may be known by the heads changing brown, you should cut off their heads, with about a foot or more of the stalk to each; tie three or four heads together, and hang them up in a dry place, where they may remain till Christmas or after, when you may thresh out the seeds for use.

LEGUME, *Legumen*, among botanists, signifies a pericarpium of an oblong, compressed figure, formed of two valves, joined by a visible suture, both on the upper and under parts; and having the seeds affixed to the upper limbs of the two valves, in an alternate order.

This is also a term applied to a species of plants, otherwise called Pulse, as peas, beans, &c.

LEGUMINOUS, an appellation given to all plants whose fruit is a legume.

LEMON-TREE, *Limon*, according to Linnæus, a species of *citrus*, but considered by other authors as a distinct genus.

There are several varieties of this fruit preserved in Italy; and, in both the Indies there are a great number, which have not yet been introduced to the European gardens, among the most remarkable ones which are found here, are, 1. The Lemon-tree with variegated leaves. 2. The sweet Lemon. 3. The pear-shaped Lemon. 4. The Imperial Lemon. 5. The Lemon called Adam's Apple. 6. The furrowed Lemon. 7. The chiding Lemon. 8. The Lemon with double flowers.

Culture of the LEMON-TREE.

All the sorts of Lemons are propagated by budding, or-inarching them either on stalks of Lemons or Citrons, produced from seeds.

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The culture of the Lemon-tree is the same with that of the Orange-tree, to which article we refer the reader; only observing here, that the common Lemons are somewhat hardier than the oranges, and will bring their fruit to maturity here better than they will do, and require to have a greater share of fresh air in the winter.

Water-LEMON, a species of the passion-flower. See the article *PASSION-FLOWER*.

LEOPARDSBANE, *Arnica*, a genus of plants, ranged by Linnæus among the *syngenesia polygamia superflua*, and of which there are six species. 1. Leopardsbane with oval, entire leaves, and those on the stalks growing opposite by pairs. 2. Leopardsbane with sawed leaves growing alternately. 3. Leopardsbane with spear-shaped leaves, the lower ones sawed, and a leafy many-flowered stalk. 4. Leopardsbane with oval indented leaves. 5. Leopardsbane with pennatifid leaves and roundish lobes. 6. Leopardsbane with pinnated leaves, and narrow segments.

The three first sorts are perennial plants, and natives of the north parts of Europe and America, and the fourth, fifth, and sixth species, are natives of Ethiopia.

Culture of the LEOPARDSBANE.

The three first species are propagated either by seeds, or parting of the roots, in autumn, when the stalks begin to decay: the seeds should also be sown in autumn, soon after they are ripe; or if they are permitted to scatter, the plants will come up the following spring: they are hardy plants, and will grow in almost any soil or situation.

The other three species are also propagated either by roots or seeds, but they are too tender to live through the winter in the open air of our climate; at that season therefore they should be placed under a common hot-bed frame; but they must have the benefit of the free air in mild weather.

LEOPARDSBANE, *Daronicum*, a genus of plants ranged by Linnæus among the *syngenesia polygamia superflua*, and of which there are four species. 1. Leopardsbane with obtuse heart-shaped leaves, those from the roots having footstalks, and those above them embracing the stalk. 2. Leopardsbane with oval-pointed leaves, indented at bottom, and alternate branches. 3. Leopardsbane with spear-shaped indented leaves, woolly on their under-side, and one flower on a stalk. 4. Leopardsbane, with a naked single stalk, having one flower.

These are all perennial plants. The first species grows naturally in Hungary and the Helvetian mountains. The second is a native of Portugal, Spain, and France. The third grows on the Helvetian and Pyrenean mountains; and the fourth is a native of Switzerland and Italy.

Culture of this LEOPARDSBANE.

The first and second species multiply very fast by their creeping roots; and if the seeds are permitted to scatter, they will produce plants wherever they happen to fall.

The third species is propagated either by seeds, or by parting of the roots. It delights in a moist soil and a shady situation.

The fourth sort is only preserved in botanic gardens for the sake of variety.

LETTUCE, *Lactuca*, a genus of plants, ranged by Linnæus among the *syngenesia polygamia aqualis*, and of which he distinguishes six species, but of these six one only is cultivated for use, and from that is raised a vast number of varieties.

The several varieties which are cultivated in the gardens of this country, and are all excellent salad herbs, which succeed one another in their several seasons, are distinguished as follows. 1. The common garden Lettuce. 2. The Cabbage Lettuce. 3. The Cilicia Lettuce. 4. The Dutch brown Lettuce. 5. The Aleppo Lettuce. 6. The Imperial Lettuce. 7. The green Capuchin Lettuce. 8. The Versailles, or upright Cos Lettuce. 9. The black Cos. 10. The red Cos. 11. The red Capuchin Lettuce. 12. The Roman Lettuce. 13. The Prince Lettuce. 14. The Royal Lettuce. 15. The Egyptian Cos Lettuce.

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Culture of the LETTUCE.

The first of these sorts is very common in all gardens, and is usually sown for cutting very young to mix with other salad herbs. It may be sown at all times of the year, but in the hot months it should be sown in shady borders, and in spring and autumn upon warm borders, and in winter under glasses, otherwise it is subject to be destroyed by severe frosts.

The Cabbage Lettuce is an improvement, by frequent cultivation, from the first sort. It may be sown at different seasons, to have a continuation of it through the summer. The first crop is generally sown in February, which should be upon an open, warm spot of ground; and when the plants are come up, they should be thinned out to the distance of ten inches each way, which may be done by hoeing them out, provided you have no occasion for the superfluous plants, otherwise they may be drawn up and transplanted into another spot of good ground at the same distance, where, if done before the plants are large, they will succeed very well, though they will not be so large as those which were left upon the spot where they were sown, but they will come somewhat later, which will be an advantage to those who do not continue sowing every fortnight.

Always observe in sowing the succeeding crops, as the season advances, to chuse a shady, moist situation, that is not under the drip of trees, otherwise, in the heat of summer, they will run up to seed before they cabbage.

In the middle of August the last crop should be sown, which is to stand over winter. The seeds should be scattered thin upon a good light soil, in a warm situation; and when the plants are come up, they must be hoed out so as to stand singly, and cut down all the weeds to clear them.

In the beginning of October they should be transplanted into warm borders, where, if the winter is not very severe they will stand very well; but in order to be certain of a crop, it will be advisable to plant a few upon a bed pretty close, where they may be arched over with hoops, and in severe frosts they should be covered with mats and straw, or pease-haulm, to secure them from being destroyed. In the spring of the year they may be transplanted out into a warm, rich soil, at the distance before-mentioned.

In order to save good seeds of this kind, you should look over your Lettuces when they are in perfection, and such of them as are very hard and grow low, should have sticks thrust into the ground, by the sides of as many of them as you intend for seed, to mark them from the rest, and you should carefully pull up all the rest from among them as soon as they begin to run up, lest when they run up to flower they should, by intermixing their farina with the flowers of the good ones, degenerate the seeds.

The Cilicia, imperial, royal, black, white, and upright cos Lettuces may be sown at the following times: the first season for sowing these seeds is at the end of February, or the beginning of March, upon a warm light soil, and an open situation, not overshadowed with trees: and, when the plants are come up, they should be either hoed out or transplanted into another spot of ground, as was directed for the cabbage Lettuce, observing to leave these sorts fifteen or sixteen inches apart each way; which will be full near enough for these plants, especially if the soil be good; and you must carefully keep them clear from weeds, which is the only culture they will require, except the black cos Lettuce, which should be tied up when they are full grown, to whiten their inner leaves, and render them crisp; otherwise they are seldom good for much, rarely cabbaging without this assistance.

The seeds of these Lettuces should be saved in the manner already directed for the cabbage Lettuce.

You may also continue these sorts through the season, by sowing them in April, May, and June; observing to sow the late crops in a moist shady situation, otherwise they will run up to seed before they grow to any size; but in August, toward the latter end, you may sow of these sorts, to abide the winter; which plants should be

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transplanted either under glasses, or into a hot-bed, which should be arched over with hoops, in order to be covered in winter, otherwise in hard winters they are often destroyed; but you must constantly let these plants have as much open free air as possible, when the weather is mild; only covering them in hard rains, or frosty weather; for if they are kept closely covered in winter, they will be subject to a mouldiness which soon rots them.

In the spring these plants should be planted out into a rich light soil, allowing them at least eighteen inches distance each way: for if they are planted too close, they are very subject to grow tall, but seldom cabbage well; and from this crop, if they succeed well, it will be proper to save the seeds; though some plants should also be marked of the crop sown in the spring, because sometimes it happens that the first may fail by a wet season, when the plants are full in flower, and the second crop may succeed, by having a more favourable season afterwards.

The most valuable of all the sorts of Lettuce in England are the Egyptian green cos, and the Versailles or white cos, and the Cilicia or white cos; though some people are very fond of the royal and imperial Lettuces; but they seldom sell so well in the London markets as the others, nor are so generally esteemed. Indeed of late years, since the white cos has been commonly cultivated, it has obtained the preference of all the other sorts, until the Egyptian green cos was introduced; which is so much sweeter and tenderer than the white cos, that it is by all good judges esteemed the best sort of Lettuce known. This sort will endure the cold of our ordinary winters full as well as the white cos; but at the season of its cabbaging, if there happens to be much wet, this sort, being very tender, is very subject to rot.

The brown Dutch and green capuchin Lettuces are very hardy, and may be sown at the seasons as was directed for the common cabbage Lettuce; and are very proper to plant under a wall or hedge to stand the winter; where many times these will abide, when most of the other sorts are destroyed; and therefore they will prove very acceptable at a time when few other sorts are to be had; they will also endure more heat and drought than most other sorts of Lettuce, which renders them very proper for late sowing; for it often happens, in very hot weather, that the other sorts of Lettuce will run up to seed in a few days after they are cabbaged; whereas these will abide near three weeks in good order, especially if care be taken to cut the forwardest first, leaving those that are not so hard cabbaged to be last. In saving of these seeds, the same care should be taken to preserve only such as are very large, and well cabbaged, otherwise the seeds will degenerate, and be good for little.

If these sorts of Lettuce are planted upon a moderate hot-bed in autumn, and covered with a good frame, they may be so well cabbaged, as to be fit for use in February and March, and may be continued till those in the open air are fit for use.

In saving seeds of all these sorts of Lettuce, observe never to let two sorts stand near each other, for by their farina mixing, they will both vary from their original and partake of each other. There should also be a stake fixed down by the side of each, to which the stem should be fastened to prevent their being broken, or blown out of the ground by the wind, to which the Cilicia, cos, and the other large growing Lettuces, are very subject when they are in flower.

When the seeds begin to ripen, such branches of the large growing Lettuces as ripen first, should be cut, and not wait to have the seed of the whole plant ripe together, which never happens: and sometimes many of the branches will ripen a fortnight or three weeks before the others. When they are cut they must be spread upon a coarse cloth to dry; after which the seeds must be rubbed out and dried again, and then carefully hung out of the reach of mice and other vermin.

The red capuchin, Roman, and prince Lettuces are pretty varieties, and cabbage very early; for which reason a few of them may be preserved; as may some of

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the Aleppo, for the beauty of its spotted leaves; though very few people care for either of these sorts at table, when the other more valuable ones are to be obtained; but in a scarcity, these may supply the place pretty well; and these sorts are very proper for soups. The seeds of these must also be saved from such as cabbage best, otherwise they will degenerate, and be good for little.

Lambs LETTUCE, or CORN SALLAD, a species of Valerian.

This plant is found growing among the corn in several parts in England. It is cultivated in gardens as a sallad-herb for the spring, but having a strong taste, which is disagreeable to many palates, it is not so much in use as it was formerly.

Culture of the Lambs LETTUCE.

It is propagated by seeds, which should be sown the latter end of August; when the plants come up they must be hoed to thin them where they grow too close, and to destroy the weeds. Early in the spring the plants will be fit for use.

LIGNUM ALOES, a species of Sebesten. See the article SEBESTEN.

LILY, *Lilium*, a genus of plants, ranged by Linnæus among the *hexandria monogynia*: he distinguishes seven species, and among these he includes the Martagon. There are many varieties of this genus, accounted distinct species by some other botanists.

The five following sorts will be a sufficient direction to the gardener for the culture of all the rest.

Double Scarlet LILY. The root is large, round, and composed of numerous scales. The stalk is round, upright, firm, and two foot and a half high. The leaves are placed irregularly, and are very numerous: they are long, narrow, waved and sharp-pointed: they are of a firm substance, and their colour is a very deep green. The rib is pale, and the whole leaf is of a shining surface. The flower stands on the top of the stalk, large, specious, and in the highest degree singular. The colour is a fine deep scarlet, covered with spots of a dusky but not disagreeable red. The petals are oblong, waved, and pointed, and of a fleshy substance; their number is about thirty, and they stand open in the manner of rays of a star.

Culture of this LILY.

This elegant variety can only be raised by seed, and when once obtained, must be increased by off-sets. The plant, in its wild state, is a native of the east, and of some southern parts of Europe, and it there grows always in a damp rich mould. This should be the rule for its soil: a mixture of two parts meadow earth, and one part pond mud, with a little rotted cow-dung, will answer very well. The seeds should be saved from a good flower, and sown on a bed of this compost in August. They will require the common care of seedling bulbous plants, and when they come to flower, there will be many varieties. If a double one do not appear from this first sowing, the whole must be repeated; and when one of these is obtained, the propagation must be by off-sets, which encreases very fast, and require the same soil. Once in three years the roots must be taken up, and their off sets separated. This should be done in the end of July; and they should then be planted again in beds of the same compost.

Scarlet Chalcedonian LILY. The root of this is bulbous, and hung with many fibres. The stalk is round, thick, two foot and a half in height, and hollow; of a pale green, spotted in the lower part with red, and marked with rays from the head of the bulb. The leaves stand irregularly, and are numerous; their colour is a fresh green, and at the edges they shew a little hairyness. They are ribbed and sharp-pointed, oblong, and large near the middle. The flowers are large and beautiful: their colour is a fine scarlet. The flower rises naked from the foot-stalk, and is composed of six petals, which unite at the bottom. The filaments are six, and they are crowned with large scarlet buttons. The seed-vessel, from whose rudiment it rises, is oblong, and marked with six furrows, and contains in three valves numerous seeds in double rows.

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Culture of this LILY.

This plant is propagated either by seeds or off-sets, and the following compost is proper for both.

Mix equal parts of rich meadow earth and pond mud, add to a barrow of these a bushel of wood-pile earth and a peck of foot: let this lie exposed to the air some months, turning it at times; chuse a part of the garden that lies dry and open, fronting the south-east: dig out the mould from part of a border, and fill up the place with this compost.

In the beginning of September let the off-sets be planted in this bed at a foot distance, and covered two inches with mould, and every year afterwards they must be taken up and planted again in a fresh soil at the same season.

Thus may the plant be propagated with little trouble, and its flowers this way will be equal to those of the original root: but if the gardener intends improvement, he must raise it from seeds in the following manner:

Let him mark for seed two or three plants when in flower, selecting such as have a great deal of red upon the stalk, and have the leaves tinged with brown: they should be such as promise many flowers, but he must only suffer three to blow upon each, and the stronger the colour of these the better. When the seeds are ripe they must be saved with great care, and dried on a papered shelf.

The second week in August prepare a bed in a part of the seminary open to the morning sun: make it with the same compost, scatter on the seeds, and cover them a quarter of an inch. The bed must be weeded often, and watered as there may be occasion; and when the plants come up they must be thinned where they grow too thick. In August let the bulbs be carefully taken up, and planted in a fresh bed at more distance, and in the beginning of the September following, let them be again removed and planted at a foot distance.

The succeeding year they will flower, and the gardener will find a great variety among them, but he must not depend on the first year's bloom, for they often alter after this. When they flower the second summer, let him mark the finest, and those most differing from one another; these, when the roots are taken up in the succeeding autumn, should be planted at fifteen inches distance, in a bed made up in the flower-garden, according to the directions already given for managing the off-sets; and the others may be planted out in common borders, for there will be few but what are worthy a place in the garden.

After this the finer kinds must be taken up every autumn, and their off-sets separated; and they must every season have a fresh quantity of compost.

The Striped LILY. The root is bulbous, and composed of a multitude of nuclei or thick scales. The leaves are long, moderately broad, waved at the edges, obtuse, and of a fresh green: tinged along the edge with a dusky brown. The stalk is round, thick, upright, and two feet and a half high; the colour a pale green, tinged variously with brown or purple. The flowers terminate and crown the stalk in an elegant tuft, six or eight of them together; they are large and very fragrant, white, and streaked along every petal with a rib of the most delicate crimson. The form of the flower is perfectly the same with that of the common white Lily. The filaments are six, they are smallest toward the top, and they are crowned with oblong, large, incumbent buttons.

Culture of this LILY.

This plant is a native of the east, and thrives in a rich soil where there is open air and some moisture. The flower ripens its seed freely, and affords off-sets very plentifully, and may be increased and propagated from either. The method by off-sets is very easy. When the leaves are decayed after the season of flowering, the roots must be taken up, and at that time there should be two beds dug up, one in the garden, the other in the nursery: that in the garden is for the reception of the old roots again, and it may either be in the same spot with change of mould, or in another: that in the nursery is for receiving the off-sets, and nourishing them

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till they are of a size to flower strongly. The off-sets being all taken off, must be planted at eight inches distance in the nursery bed, and covered an inch with the mould; the old roots should be allowed fifteen inches distance every way. The roots must be taken up once every year: this not only affords more off-sets for propagation, but the old roots flower much stronger for being cleared of them. They are to be planted again as soon as cleared from these. When the off-sets have stood in the nursery bed till they flower strongly, they are to be brought into the garden, and treated just as the others. This is the method of encreasing the striped Lily by off-sets, and thus it will retain its nature; but the elegance of colouring and farther variation, is only to be had by a careful sowing of the seeds.

To this purpose let a good plant be marked for seed, and encouraged to ripen them perfectly, by suffering only the three first flowers which open to remain, and by frequent watering and breaking of the soil. Let the stalk be tied up to a firm stake, to prevent the accidents from winds; and when the seed-vessels are tolerably hardened upon the plant, let them be taken off, and laid for a fortnight upon a papered shelf, turning them every day; then open them, take out the seeds, spread them upon the shelf, and air them ten days: at the end of this time they will be fit for sowing. Dig out a piece of ground in a part of the nursery which is well sheltered, but open to the morning sun; fill up the place with fresh mould taken from under the turf in a rich pasture, and scatter on the seeds. Sift over them a finger's breadth of the same mould, and lay some branches of a thorn-bush over the bed, to prevent accidents. The bed must always be kept clean from weeds, and when the plants come up let them be thinned where they rise too close, and from this time carefully watered; if they are exposed to the noon sun, the bed must be shaded by a reed-hedge.

In the beginning of August let a large bed of the same earth be prepared, and let the mould be taken off the surface of the seed-bed so deep as to take up all the roots; let this earth with the roots in it, for they are too small to plant separate, be spread carefully over the surface of the new bed, and sift over it half an inch more of the same mould. In severe weather cover it with some pea-straw, and in spring stir the surface very lightly and gently, so as not to disturb the roots, and sift on half an inch more of the mould; the leaves will soon appear, and the bed must be carefully weeded, and well watered in dry seasons, a little at a time, but often repeated. In the September following make up a large bed, and separate the roots by sifting the mould of the first bed. Plant them in this new bed at four inches distance, see the heads are placed upwards, and sift over them more mould till they are covered one inch. The second year after this removal they will flower, and there will be found an elegant variety; as a great quantity of the seed of the common white Lily would have a chance to raise some striped flowers, so there will probably be from the seed of the striped some white ones, but the striped ones will be very numerous, and there will be among them a great deal of variation. These roots must be managed as we have before directed for the off-sets; they must be taken up every year, and planted at four inches distance, in a nursery bed to gather strength; the grown roots thus cleared, must be planted again as at first, only in fresh mould.

Late Bulliferous LILY. The root is large, bulbous, and composed of numerous loose scales, white and juicy. The stalk is firm, thick, upright, a yard high, frequently a little flatted, and of a pale green, tinged variously with yellow, brown or purple. The leaves stand irregular upon it, and are numerous; they are oblong, moderately broad, undivided at the edges, and sharp-pointed: of a deep green colour, often tinged with brown, and marked with strong ribs lengthways. The flowers are very large and beautiful: they crown the stalk two or more together, and they are wide expanded, and of a deep crimson, mixed with a tinge of orange: the rising spots on the inside of the petals are of a deep blood-

blood colour, and there is a richness in the whole flower, exceeding very much the other orange Lilies. The form of the flower is that of the common Lily: it rises without any cup from the head of the foot-stalk, and is composed of six long and large petals, which unite at the bottom in a small campanulated base, and at the extremities they are thick and fleshy. In the centre stand six filaments, with large oblong buttons, and in the midst of them a single style. This is terminated by a thick triangular head, and rises from an oblong rudiment of a seed-vessel, marked with six ridges. This afterwards ripens into a large seed-vessel of the same form, large, and formed of three valves, with three cells loaded with seeds, in a double series.

The bulbs, whence it obtained its name, are certain solid lumps, which appear in the bosoms of their leaves. Their form is oval, or nearly so: their texture loose, and their substance juicy; they have no foot-stalks, but adhere to the main stem of the plant by their base, just where the leaf also adheres: and their colour is green, tinged like the stalk and leaves, occasionally with yellow, brown or red. These bulbs appear with the leaves, and swell, and obtain soon after their due bigness; after this they drop off, and taking root, produce new plants, in the same manner as seeds would do, but much quicker; they continue to be produced in great abundance till the plant has come to the full strength of flowering, but after that they grow from time to time less numerous, till upon a strong stem there will not be more than four or five.

Culture of this LILY.

It is a native of the warmer parts of Europe, but it bears without hazard the open air, and full ground in our gardens, and requires no compost: for nothing suits it better than the common mould. There are three different methods of cultivating or raising the plant; the first by off-sets from the root, the second by seeds, and the last by their bulbs produced in the bosoms of the leaves. If we wanted varieties, we should propose the method by seeds: but the flower is naturally so beautiful, that the change must be for the worse. The propagation by off-sets weakens the main plant; for it must stand three years in order to produce any quantity.

For these reasons the bulbs are preferable to any other method of propagation. They are to be taken off when perfectly ripe, and they will flower the second year. The soil is to be the common garden mould: the bulbs must be planted at a foot distance, and covered half an inch, and not to be removed any more till after flowering. They will require no other care but weeding and watering, and when they have flowered they should be taken up: the latter end of September is the best time; the bed should be new dug, the roots cleaned from their off-sets, and then planted again at the same distance. They will thus flower in perfect beauty from year to year, and they will always produce abundance of new bulbs from the young plants, so that sowing is quite needless.

Double White LILY. The root is scaly, and forms a large bulb. The stalk is a yard high. The leaves are long, moderately broad, and waved at their edges: and the flowers crown the divisions of the stalk at the top, and the shoots which rise from the bosoms of the upper leaves. They are long and irregular, white as in the common Lily, but composed of more numerous petals.

Culture of this LILY.

The first production of it must be from seed, but after it is once obtained, the propagation and increase will be easy from off-sets of the root, taken away at the time of removing it after flowering. The best way of raising double flowers from the seed of the single, is by allowing a large seed-bed, and sowing a sufficient quantity; this must be repeated a second and a third time, if they do not succeed the first: for if the double flower is not produced, there will be always remarkable fine plants of the common kind. When by repeated sowings the expected kind is produced, it should be nursed with care for the production of off-sets, it should be allowed a good soil, a great deal of room, and frequent waterings,

and it should not be suffered to exhaust itself in flowering. At the end of this time it must be taken up, and the off-sets being removed, must be planted at ten inches distance, in a nursery-bed, to gain strength; and when they are fit for flowering, they are to be taken into the gardens.

LILY *Asphodel*, or Day LILY, *Hemerocallis*, a genus of plants, ranged by Linnæus among the *hexandria monogynia*, and of which there are two species. 1. Lily *Asphodel*, with a branching stalk, and a flower consisting of one petal. 2. Lily *Asphodel*, with a single stalk, and bell-shaped flowers, consisting of six petals; called Savoy Spiderwort.

The first species is a native of Hungary, Dalmatia, and Istria. It has strong fibrous roots, to which hang tubers like those of the *Asphodel*, from which come out keel-shaped leaves a foot and a half long. The flower-stalks rise naked about two feet high, having two or three longitudinal furrows; at the top they divide into three or four short foot stalks, each sustaining one pretty large yellow flower, shaped like a Lily, having but one petal, with a short tube, spreading open at the brim, where it is divided into six parts; these have an agreeable scent.

The second species is a plant of humbler growth than either of the former; there are two varieties of this: the first of these rises with a flower-stalk more than a foot and a half high; the flowers are much larger, and there is a greater number upon each stalk than of the second. The leaves of this sort are somewhat like those of the Spiderwort, are pretty firm and grow upright. The flower-stalks grow about a foot high, and have several white flowers at the top, shaped like those of the Lily, which hang on one side, and have an agreeable scent; these are but of short duration, seldom continuing in beauty above three or four days: but when the plants are strong, they will produce eight or ten flowers upon each stalk, so they make a good appearance while they last.

Culture of the LILY *Asphodel*.

The first species is easily propagated by off-sets, which the roots send out in great plenty, and may be taken off in autumn, that being the best season for transplanting of the roots, and planted in any situation, for they are extremely hardy, and will require no other culture but to keep them clean from weeds, and to allow them room, that their roots may spread: they may also be propagated by seeds, which, if sown in autumn, the plants will come up the following spring, and these will flower in two years; but if the seeds are not sown till spring, the plants will not come up till the year after. The second species is usually propagated by parting the roots: autumn is the best time for doing this. These plants should not be transplanted oftener than every third year, when the roots may be parted to make an increase of the plants, but they should not be divided too small, for if they are it will be two years before they flower; they delight in a light loamy soil, and in an open exposure, so must not be planted under the drip of trees; but if they are planted to an east aspect, where they may be protected from the sun in the heat of the day, they will continue in beauty longer than when they are more exposed.

LILY DAFFODIL, *Amaryllis*. See the article **AMARYLLIS**.

LILY OF THE VALLEY, or SOLOMON'S SEAL, *Convallaria*, a genus of plants, ranged by Linnæus among the *hexandria monogynia*, and of which there are ten species. 1. White Lily of the Valley. 2. Broad-leaved Lily of the Valley. 3. Common broad-leaved Solomon's Seal. 4. Broad leaved Solomon's Seal, with a large sweet flower. 5. Greatest broad-leaved Solomon's Seal. 6. Broad-leaved Solomon's Seal, with a white hellebore-leaf. 7. Lily of the Valley, with leaves growing in whorls. 8. Lily of the Valley, with leaves sitting close to the stalks, which are terminated by compounded spikes of flowers. 9. Lily of the Valley, with many leaves embracing the stalks, which are terminated by single bunches of flowers. 10. Lily of the Valley, with heart-shaped leaves.

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The first sort grows naturally in great plenty in the woods near Wobourn, in Bedfordshire. This hath a slender fibrous root, which creeps under the surface of the ground. The leaves come up by pairs: their foot-stalks, which are about three inches long, are wrapped together in one cover, and at the top divide into two parts, each sustaining a single leaf, one of which rises a little above the other; these leaves are from four to five inches long, and near an inch and an half broad in the middle, lessening gradually to both ends; the foot-stalks of the flowers arise immediately from the root, on one side the leaves: these are naked, about five inches long, and are adorned towards their upper parts with pendulous white flowers, ranged on one side the stalk, which decline to one side; each flower stands upon a short separate foot-stalk, which are crooked. The flowers are open, of the short bell-shaped kind: they have six stamina, which are inserted in the petal of the flower, and are shorter than the tube, and a single style arising from the germen, which is triangular, and crowned by a three-cornered stigma: the germen afterwards becomes a globular berry, of a red colour when ripe, inclosing three roundish seeds.

The second sort grows on the Alps. The third sort is the common Solomon's Seal, which is supposed to grow wild in this country. This plant hath a fleshy white root, which creeps in the ground, and is full of knots. In the spring arise several taper stalks, which grow near two feet high, adorned with oblong oval leaves, placed alternately: on the opposite side come out the foot-stalks of the flowers, which are about an inch long, dividing at the top into three or four smaller, sustaining a single tubulous flower, cut into six parts at the brim: these have each six slender stamina, surrounding a single style, which arise from the germen, and is crowned by a blunt stigma: the germen afterwards becomes a round berry, each inclosing three seeds.

The fourth species doth not rise so high as the third, the leaves are broader: it hath fewer flowers on each foot-stalk, and those are much larger, and smell sweet. The fifth sort rises much higher, the leaves are broader, there are many more flowers on each foot-stalk, which have longer and narrower tubes than either of the former. This grows naturally in the northern parts of Europe.

The sixth species hath large fleshy roots, full of knots or joints, which send up many stalks four feet high, and above two inches broad. The flowers come out on the opposite side of the stalks from the leaves, having short foot-stalks, which divide into three smaller, each sustaining one flower, with a long slender tube, more closed at the top than those of the other species, but the colour is the same. The seventh species rises with an upright stalk, about two feet high, having long narrow leaves, which stand in whorls round the stalk: there are generally five of these placed at each joint, they are four inches long, and half an inch broad, smooth, and of a light green. The flowers come out from the same joints, standing upon short foot-stalks, each supporting five or six flowers, which are smaller, and have much shorter tubes than either of the former sorts; they are of a dirty white, tipped with green, and slightly cut into six parts at the top.

The eighth species grows naturally in most parts of North America. This rises with an upright stalk above two feet high, with oblong leaves ending in sharp points, which are near five inches long, and two and an half broad. The leaves are alternate, standing close to the stalks, and are of a light green on their upper side, but are paler on their under. The flowers are produced in branching spikes at the extremity of the stalks, each being composed of several small loose spikes of star-like flowers, of a pale yellow, which fall away without producing any seed.

The ninth species is a native of the same country as the eighth: this sends up stalks two feet high, which have oblong leaves. The flowers are produced in single spikes at the top of the stalks, which are in shape and colour like those of the eighth: but these are succeeded by small

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red berries, about the size of those of the Lily of the Valley.

The tenth sort is an humble plant, which when transplanted into gardens, seldom rises above six inches high, and where it grows naturally not much more than half so high; this hath a fibrous creeping root, which spreads and multiplies greatly in the ground, sending up many slender stalks, each having for the most part two heart-shaped leaves, one standing above the other. The stalks are terminated by loose spikes of white star-like flowers, which are succeeded by small red berries.

Culture of the LILY of the VALLEY.

The first and second species love a loose sandy soil, and a shady situation; they are propagated by parting of their roots, which multiply in great plenty: they should be planted a foot asunder, that their roots may have room to spread: for if they agree with the soil and situation, they will meet and fill the ground in one year. If these roots are planted in a rich soil, they will spread and multiply greatly, but will not be so productive of flowers. The only culture which these plants require, is to keep them clean from weeds, and to transplant and separate the roots every third or fourth year, otherwise they will be so greatly matted together as not to have proper nourishment, so the flowers will be but small, and few in number.

All the species of Solomon's Seal are very hardy plants, and delight in a light soil and a shady situation, so are very proper to plant in wilderness quarters, under tall trees, where, if they are not crowded by lower shrubs, they will thrive and multiply exceedingly, and during the summer season will make an agreeable variety. They all multiply very fast by their creeping roots, especially when they are planted in a proper soil and situation. The best time to transplant and part the roots is in autumn, soon after their stalks decay; those which are removed at that season, will grow much stronger than those which are planted in the spring: but they may be safely transplanted any time after the stalks decay, till the roots begin to shoot in the spring. As these roots greatly increase, so they should be planted at a wide distance from each other, that they may have room to spread: for they should not be removed oftener than every third or fourth year, where they are expected to grow strong, and produce a good number of stalks, in which their beauty consists. The only culture these plants require, is to dig the mould between them every spring, and keep them clean from weeds.

Belladonna LILY, a species of Amaryllis. See AMARYLLIS.

Bloody LILY, or AFRICAN TULIP. See AFRICAN TULIP.

Ceylon LILY, a species of Amaryllis. See AMARYLLIS.

Day LILY. See *Lily Asphodel*.

Guernsey LILY, a species of Amaryllis. See the article AMARYLLIS.

Jacobæan LILY, a species of Amaryllis. See AMARYLLIS.

Persian LILY, a species of Fritillary. See FRITILLARY.

Superb LILY, *Gloriosa*, a genus of plants, ranged by Linnæus among the *hexandria monogynia*, of which he distinguishes one species only.

This plant is perennial, and a native of Malabar. It has oblong fleshy roots, of a whitish colour, from which rise a round weak stalk, and grows to the height of eight or ten feet. The leaves are placed alternate; they are smooth, about eight inches long, and one and a half broad at the base, growing narrower till within two inches of the end, which runs out in a narrow point, terminated by a tendril, or clasper, by which it fastens itself to any neighbouring support. The flowers are situated on the upper part of the stalk, standing upon slender foot-stalks: they are composed of six oblong petals, ending in acute points. On their first opening they are of a yellowish herbaceous colour, and stand erect, but when fully opened hang downward, in the manner of the Fritillaries; the petals turn quite back;

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and change to a beautiful red colour, their acute points meeting at the foot-stalk. This plant flowers in July, and often perfects seeds in this country.

Culture of the Superb LILY.

It is propagated by parting of the roots, which should be taken out of the ground in autumn, after the stalks decay, and preserved in sand in the stove, or a warm room, during the winter. In the spring these must be planted in pots filled with light earth, and plunged in the tan-bed in the stove.

Towards the end of March or beginning of April, their stalks will appear, when some tall sticks should be put down by them to support them, otherwise they will trail over the neighbouring plants. In summer they require frequent but gentle waterings.

Those roots which are not taken out of the pots in winter, should be transplanted and parted the beginning of March, before they put out new fibres and stalks, for they must not be removed when in a growing state. The pots in which these roots are planted should not be too large, for unless they are confined, they will not put out strong stalks.

Water LILY, *Nymphaea*, a genus of plants, of which there are several species: most of them grow in very warm climates, and are never cultivated in this country. The two following are natives of England. 1. Water Lily, with a large five-leaved empalement; or yellow Water Lily. 2. Water Lily, with heart-shaped, entire leaves, and a four-pointed empalement, or white Water Lily.

They are both found in standing waters in many parts of England, having large roots, which are fastened in the ground, from which the stalks rise to the surface of the water, where the leaves expand and float: they are large and roundish, and those of the second species are heart-shaped. The flowers rise between the leaves, and swim upon the surface of the water. These appear in July, and the seeds ripen in August.

Culture of the Water LILY.

The best method of propagating these plants is to procure some of their seed-vessels just as they are ripe, and ready to open; these should be thrown into canals, where the seeds will sink to the bottom, and the following spring the plants will appear floating upon the surface of the water, and in June or July will produce their beautiful large flowers.

When they are once fixed to a place, they will multiply exceedingly, so that in a few years the whole surface of the water will be covered with them.

LIME-TREE, *Tilia*, a genus of plants, ranged by Linnæus among the *polyandria monogynia*, and of which there are only two species. 1. Lime-tree, with flowers that have no nectarium. 2. Lime-tree, with flowers furnished with a nectarium.

The first species of this tree grows naturally in many parts of England, and other countries of Europe, and contains several varieties. The second species is a native of Virginia, Canada, and other countries in North America.

Culture of the LIME-TREE.

Both species are easily propagated by layers, which in one year will take good root, when they should be removed into the nursery, and planted at four feet distance in rows, and the plants two feet asunder in each row. The best season for removing them is Michaelmas. They should remain four or five years in the nursery, and may then be removed to the places where they are designed to remain. They succeed best in a strong, fat, loamy soil.

These trees may also be propagated by cuttings; and when large trees are required, they should be raised from seeds sown in autumn, soon after they are ripe, upon a shady border of moist, light soil. When the plants come up they should be managed in the manner already directed for those raised from layers.

LION'S-FOOT, *Catananche*, a genus of plants, ranged by Linnæus among the *syngenesia polygamia*: of which he reckons three species. 1. Lion's-foot, with the under scales of the cup oval. 2. Lion's-foot, with

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the under scales of the cup spear-shaped. 3. Lion's-foot, with cut leaves.

The first species grows naturally in the south of France. The second is a native of Crete; and the third of the maritime parts of Greece. They are all annual plants.

Culture of the LION'S-FOOT.

These three species propagated by seeds, which should be sown in March on beds or borders of light earth, where they are to remain. When the plants come up they will only require the common care of being kept clean from weeds, and thinned where they grow too close.

LION'S-TAIL, *Leonurus*, a genus of plants, ranged by Linnæus among the *didynamia gymnospermia*: of which there are four species. 1. Lion's-tail, with spear-shaped, three lobed leaves on the foot-stalk; or common Motherwort. 2. Lion's-tail, with oval, spear-shaped, serrated leaves, and sessile, prickly cups. 3. Lion's-tail, with leaves divided into three parts, which are cut in their edges, and with hairy cups. 4. Lion's-tail, with leaves divided into three parts, which terminate with narrow, blunt segments.

The first species is a perennial plant: it grows naturally in many parts of England, and other countries in Europe, but is never cultivated in gardens except for the sake of variety. The other species, which are biennial plants, grow naturally in different parts of Europe.

Culture of the LION'S-FOOT.

They are propagated by seeds, which in spring must be sown upon a bed of common earth. When the plants come up, they must be kept clear of weeds, and thinned where they grow too close. In autumn they may be transplanted to the places where they are designed to remain, and they will require no farther culture.

LIPPIA, a genus of plants, of which there is but one known species.

This plant is a native of the Indies, where it rises to the height of sixteen or eighteen feet. The branches come out opposite, as do also the leaves, which are oblong, pointed, and a little sawed on their edges. From the wings of the leaves come out foot-stalks, which sustains many round scaly heads, about the size of a large pea, in which are many small yellow flowers appearing between the scales, which are succeeded by seed-vessels.

Culture of the LIPPIA.

This plant will not thrive in our climate, unless it is preserved in a warm stove, and plunged in the bark-bed, observing to admit a large share of air to it in warm weather, allowing frequent waterings, and treating it in every respect in the manner of other tender shrubby plants, which are natives of the same country.

LIQUORICE, *Glycyrrhiza*, a genus of plants, ranged by Linnæus among the *diadelphia decandria*: of which there are three species. 1. Liquorice, with prickly pods. 2. Liquorice, with smooth pods; or the common Liquorice. 3. Liquorice, with hairy pods.

The first species grows naturally in Apulia and Tartary; the second in Franconia, France, and Spain; and the third in the Levant.

Culture of the LIQUORICE.

The first and third species are never propagated in any other than botanic gardens.

The second species is cultivated to great advantage in many parts of England, particularly at Pontefract in Yorkshire, and about Godalmin, in Surry.

Liquorice delights in a rich sandy soil, which should be three feet deep at least: for the greatest advantage consists in the length of its roots.

The ground designed for Liquorice must be well dug, and dunged the year before, that the dung may be thoroughly rotted in it: and just before it is planted, the earth should be dug three spades deep, and laid very light.

The plants which are to be set should be taken from the sides or heads of the old roots, and each must have a very good bud or eye, otherwise they are very subject to miscarry: they should also be about ten inches long,

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and perfectly sound. The best season for planting them is the end of February, or the beginning of March; and this must be done in the following manner.

Rows must be marked by a line drawn across the bed at two feet distance, and the plants must be set in these, making a hole something more than their full depth, that the eye of the root may be an inch below the surface: and they must be allowed two feet distance from each other in every row. When this is done, the ground may be sown over with onions, which not rooting deep, will do the Liquorice no injury for the first year. In October, when the stalks of the Liquorice are decayed, a little very rotten dung should be spread over the surface of the ground.

Three years after the time of planting, the Liquorice will be fit to take up for use; and this should be done just when the stalks are dead: for if taken up sooner, the roots are apt to shrink greatly in their weight.

The roots about London look browner than those which have been propagated in a less rich soil, but then they are much larger, and grow quicker to their size.

Wild LIQUORICE, LIQUORICE VETCH, or MILK VETCH, *Astragalus*, a genus of plants, ranged by Linnaeus among the *diadelphia decandria*: of which there are twenty species: some of them are never admitted into gardens; and all those which are, require the same manner of culture.

Culture of the Wild LIQUORICE.

It is propagated by seeds, which should be sown in April. When the plants are come up, let them be thinned so as to be left at the distance of eighteen inches every way; after which they must be kept clean from weeds, which is all the culture they require.

LIFIA, a genus of plants, which has no English name, and only one known species.

This plant, though superior to most we cultivate, is little known in our gardens. The root is a regular bulb, of a brown colour, and a firm substance. The leaves rise three or four in a cluster, embracing each other at the base: and there are usually some small, imperfect or decayed ones about their bottoms: these are of a yellowish hue, the others of a very elegant green, of a blueish tinge, and stained lightly with purple at the base. They are broad, oblong, waved a little at the edges, and terminate in a point.

The stalk rises a foot or more in height, naked, firm, purplish at the bottom, and green on the upper part; the top bends with the weight of a large single flower. It is at first contained in a scabbard, of an oblong, pointed form, which bursting into three parts, discloses the perfect flower. This is in the highest degree singular, as well as beautiful. It is composed of six distinct petals, three broad and three narrow; the three broad which stand upwards are of the most perfect scarlet: the three lower are variegated with green and yellow, both very strong and lively colours, and they have their points tipped with crimson. In the centre of the flower rise three filaments, which have their place under the uppermost petal, and are of a pale flesh-colour, with large buttons of a deeper scarlet than the flower. Down the middle of each of the lower petals there also runs a vein of deeper red: and along the midst of each of the three upper, there runs a like vein, with several smaller broken lines, with the same degree of red; this gives the whole flower a grace unknown almost to any other.

Culture of the LIFIA.

This plant is a native of Africa, where it grows on the sides of hills in a loose but not barren soil: from thence the roots may be obtained; and the time of taking them up should be when the leaves are faded. At their coming into Europe they must be planted each in a separate pot, with a mixture of three parts pasture earth, and one part sand, and placed in the shade.

Once in a week they should have a little water till they shoot: after which they must be removed into an open place, where the sun has more power, and watered gently every evening.

Towards autumn they must be removed into the greenhouse, and thence into the stove, where, with the

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common care of foreign bulbous plants, they will produce their most conspicuous and elegant flowers. The plant thus once established, there will be no fear of multiplying the roots, for they will produce off-sets, which being taken off once in three years, will rise to perfection by the same methods.

LIVE-EVER, or Lesser ORPINE. See the article *Lesser ORPINE*.

Noble LIVERWORT, Hepatica. See the article *HEPATICA*.

LOAM, a common superficial earth, consisting of clay with a small admixture of sand in it.

LOBELIA, a genus of plants, which has no English name; there is only one species of it.

This plant rises with a succulent stalk, five or six feet high. The leaves are oval, oblong, placed alternately, and sit close to the stalk. The flowers are produced upon long foot-stalks, each sustaining two or three white flowers of one petal, cut into five acute segments at the brim. It grows naturally in many islands in the West-Indies.

Culture of the LOBELIA.

It is propagated by seeds, which must be procured from the places where it is native. These should be sown in pots, and plunged into a hot-bed of tanners-bark, where the plants will appear in about five or six weeks, if the bed is kept warm, and the earth often watered.

When the plants are about two inches high, they should be carefully taken out of the pots in which they were sown, and each planted in a separate small pot, and then plunged into the hot-bed again, observing to shade them in the heat of the day till they have taken new root. The plants may remain in this hot bed till the middle, or latter end of September, when they must be removed into the stove, and plunged into the tan-bed, where they must be treated in the same manner as other tender exotic plants, which require a stove to preserve them through the winter.

LOCKER GOWLANS, a species of *Globe Ranunculus*. See the article *Globe RANUNCULUS*.

LOCULAMENTS, the cell or hollow compartments of a capsule, in which the seeds are lodged. See the article *CAPSULE*.

LOCUST, or CAROB-TREE. See the article *CAROB-TREE*.

LOCUST-TREE, *Hymenaea*, a genus of plants, of which there is only one known species.

This tree grows in great plenty in the West-Indies, where it becomes large and spreading. The stem is covered with a russet bark, and divides into many spreading branches. The leaves are smooth, stiff, and stand by pairs, their base joining at their foot-stalk. The flowers are produced in loose spikes at the ends of the branches, some of the foot-stalks supporting two, and others three flowers, which are composed of five yellow petals, striped with purple. The stamina are much longer than the petals, of a purplish colour. The flowers are succeeded by brown pods, which contain four seeds.

Culture of the LOCUST-TREE.

It is raised from seeds, which must be procured from America, and sown in pots, and plunged into a hot-bed of tanners-bark. The best method is to put but one seed into each pot: or if there is more, when the plants appear, they should be all, except one, drawn out, and if great care is not taken, the plant intended to be left will be drawn out with the others: it should therefore be done while the plants are quite young, that the roots may not be entangled with each other.

The roots of this plant are very slender, which makes it difficult to transplant: for unless a ball of earth is preserved to them, they seldom survive their removal, therefore they must seldom be transplanted from one pot to another. They must constantly remain in the tan-bed in the stove, and should be treated in the same way with other tender exotics, giving them but little water, especially in winter.

Honey-LOCUST. See the article *HONEY-LOCUST*.
LOGWOOD,

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LOGWOOD. *Hematoxylum*, a genus of plants, of which there is but one species.

This tree grows naturally in the bay of Campeachy, at Honduras, and other parts of the Spanish West Indies, where it rises from sixteen to twenty-four feet high. The stems are generally crooked and no thicker than a man's thigh. The branches, which come out on every side, are crooked, irregular, and armed with strong thorns. The leaves are winged, and composed of three or four pair of obtuse lobes, indented at the top. The flowers come out in a racemus from the wings of the leaves, standing erect; they are of a pale yellowish colour, with a purple empalement.

Culture of the LOGWOOD.

The seeds of this tree are frequently brought from America, which, if fresh, readily grow, when sown upon a good hot-bed. When the plants come up, they should be transplanted on another hot-bed, which, if kept in a moderate degree of heat, the plants will rise a foot high the same year. They are very tender, so should be constantly kept in the bark-stove, where, if they are duly watered, and the stove kept in a good degree of heat, they will succeed extremely well.

LONDON-PRIDE, a species of Saxifrage. See the article SAXIFRAGE.

LOOSE-STRIPE, *Lyfimachia*, a genus of plants ranged by Linnæus among the *pentandria monogynia*, and of which he distinguishes eleven species; but four of these only are cultivated in gardens; the rest growing wild in many parts of England. 1. Loose-stripe, with single bunches of flowers terminating the stalks, and obtuse petals to the flowers, and stamina shorter than the petals. 2. Loose-stripe, with spear-shaped spreading spikes of flowers terminating the branches, and stamina longer than the petals. 3. Loose-stripe, with leaves placed by fours, and foot-stalks placed in whorls round the stalks, each sustaining a single flower. 4. Loose-stripe, with hairy foot-stalks, and nodding flowers.

The first species is an annual plant, which grows naturally in Media. The second species grows naturally in the East, and is also an annual plant. The third species is a native of Holland, and has perennial creeping roots. The fourth sort is a native of Canada, and has also a perennial creeping root.

Culture of the LOOSE-STRIPE.

The first kind is propagated by seeds, which should be sown early in the spring, in the place where the plants are to remain: when they come up, they should be kept clean from weeds, and thinned to the distance of four or five inches, where they grow too close. The second species is also propagated by seeds, which should be sown in autumn, soon after they are ripe; and from those the plants will come up the following spring: they must be kept clean from weeds till autumn, and then planted in the border of the pleasure-garden, where they will flower and produce ripe seeds the summer following. The third and fourth species are easily propagated by their creeping roots, without any culture.

LOPPING, the cutting off the side branches of trees. It is very observable that most old trees are hollow within; which does not proceed from the nature of the trees, but is the fault of those who have the management of them, who suffer the tops to grow large before they lop them; as the ash, elm, hornbeam, &c. and persuade themselves, that they may have the more great wood; but in the mean time do not consider that the cutting off great tops endangers the life of a tree; or at best wounds it so, that many trees yearly decay more in their bodies than the yearly tops come to; and at the same time that they furnish themselves with more great wood, they do it at the loss of the owner. And, indeed, though the hornbeam and elm will bear great tops when the body is little more than a shell; yet the ash, if it comes to take wet at the head, very rarely bears more top after the body of the tree decays. Therefore, if once these trees decay much in the middle, they will be worth little but for the fire: so that if you find a timber-tree decay, it should be cut down in time that the timber be not lost.

The lopping of young trees that is at ten or twelve

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years old at most, preserves them much longer, and will occasion the shoots to grow more into wood one year, than they do in old tops at two or three. Great boughs, ill taken off, spoil many a tree; for which reason they should always be taken off close and smooth, and not parallel to the horizon; and cover the wound with loam and horse-dung mixed, to prevent the wet from entering into the body of the tree. When trees are at their full growth, there are several signs of their decay; and as the withering or dying of many of their top branches; or if the wet enters at any knot; or they are any wise hollow or discoloured; if they make but poor shoots; or if wood-peckers make any hole in them.

This lopping of trees is only to be understood for pollard-trees; because nothing is more injurious to the growth of timber-trees, than that of lopping or cutting off great branches from them. Whoever will be at the trouble of trying the experiment upon two trees of equal age and size, growing near each other, to lop or cut off the side branches from one of them, and suffer all the branches to grow upon the other, will, in a few years, find the latter to exceed the other in growth every way; and this will not decay near so soon. All sorts of resinous trees, or such as abound with a milky juice, should be lopped very sparingly; for they are subject to decay when often cut. The best season for lopping these trees is soon after Bartholomew-tide; at which time they seldom bleed much, and the wound is commonly healed over before the cold weather comes on. *Miller's Gard. Dict.*

LORANTHUS, a genus of plants for which there is no English name, and only one species. This plant is a native of America. It rises with a shrubby stalk eight or ten feet high, dividing into several branches. The leaves are oblong, and have three longitudinal nerves. The flowers grow at the ends of the branches in small clusters. Their colour is a bright scarlet; and they are succeeded by oval berries, with a pulp covering a hard shell, which incloses a number of seeds.

Culture of the LORANTHUS.

This plant is propagated by seeds, which should be sown as soon as they are ripe, for if they are kept out of the ground long, they seldom grow, or if they do, it is not till the next year.

The seeds should be sown in pots, and kept the first summer in a moderate hot-bed; in autumn they must be removed into the stove, and plunged into the tan-bed, where the earth must be kept moist. In the spring they must be taken out, and placed in a fresh moderate hot-bed, which will bring up the plants, which must be planted each in a separate small pot, and kept in the bark-stove, where they must be treated in the manner directed for other tender plants from the same country.

LOTE, or **NETTLE-TREE**, *Celtis*, a genus of plants ranged by Linnæus among the *polygamia monoecia*, of which there are four species. 1. Lote-tree with spear-shaped pointed leaves, which are veined and sawed on their edges. 2. Lote-tree with oblique, oval leaves, which are sawed on their edges. 3. Lote-tree with oval, heart-shaped leaves, slightly indented, and short foot-stalks. 4. Lote-tree with oblong, oval, obtuse, nervous leaves.

The first species rises with an upright stem to the height of forty or fifty feet. The branches are slender, and covered with a dark-coloured bark. The leaves are placed alternate, they are near four inches long, and two broad in the middle, ending in long sharp points, and deeply sawed on their edges. The flowers are placed at the wings of the leaves all along the branches; they appear in spring, and generally decay before the leaves have attained half their size; they have no petals, but a green herbaceous empalement, so make no appearance; they are succeeded by a round black berry.

It is a native of the south of France, Spain, and Italy.

The second species is a native of North America, where it grows to a large size, rising with a strait stem, and branching out on every side. The leaves are oblique, oval, ending in acute points, and sawed on their edges. The flowers stand opposite to the leaves upon long foot-stalks,

stalks, which, as well as those in the first species, are male and hermaphrodite; the latter are preceded by round berries of a dark purple colour.

The third species is a native of Armenia. It rises to the height of ten or twelve feet. The branches spread on every side, and are covered with a smooth greenish bark. The leaves are oblique, about an inch and a half long, and one inch broad, and of a pale green: they are placed alternate on the branches, and have short foot-stalks. The flowers are placed in the same manner as those of the second species.

The fourth species grows naturally in Jamaica, where it rises with a straight trunk near twenty feet high, dividing into many branches upwards. The leaves are near four inches long, and two and a half broad, round at their extremity; their upper surface is very smooth, and the under of a lucid gold colour: they stand alternate on the branches.

Culture of the LOTUS or NETTLE-TREE.

The first, second, and third species are propagated by seeds, which should be sown soon after they are ripe, if they can be procured at that season, for these frequently come up the following spring: whereas those which are sown in the spring, never come up till the next year.

The best way is to sow them in pots or tubs, that may be easily removed. In summer they must be constantly kept clean from weeds, and if the season proves dry, they will require water two or three times a week. In autumn the pots must be placed under a hot-bed frame, or where there is not that convenience they should be plunged into the ground near a wall or hedge, and covered with mats, straw, or pease-haulm, to protect them from frosts.

The following spring the plants should be taken out of the pots, and planted in the full ground: this should be done about the middle or latter end of March, when the severe frosts are generally over: for this purpose a bed or two should be prepared, according to the number of the plants raised, in a sheltered situation, and a gentle loamy soil. The ground must be well trenched, and cleared from the roots of bad weeds, and, when levelled, should be marked in rows at one foot distance; then the plants must be carefully turned out of the pots and separated, so as not to tear their roots, and planted six inches asunder in the rows, pressing the earth down close to the roots. If the ground is very dry when they are planted, and there is no appearance of rain, it will be proper to water the beds, to settle the ground to the roots of the plants, after which there should be some old tan or rotten dung laid upon the ground, which will keep it moist, and prevent the drying winds from penetrating to the roots of the plants.

The plants may remain in the nursery beds two years, by which time they will have obtained sufficient strength to be transplanted where they are designed to remain; for as these plants extend their roots very far every way, if they stand too long in the nursery, they may be injured in removing, which would be a prejudice to the future growth of the trees.

The fourth species is also propagated by seeds, which seldom come up the first year. They should be sown in pots, and plunged into the tan-bed in the stove, where they should remain till the plants come up. They must be constantly kept in the bark-stove, and treated in the same manner as other tender exotics.

LOTUS, *Birds-foot Trefoil*, a genus of plants, ranged by Linnæus among the *diadelphiea decandria*, and of which he enumerates fifteen species. 1. Lotus, with single membranaceous quadrangular pods, and spear-shaped bractæ. 2. Lotus, with single membranaceous, quadrangular pods, and oval bractæ; commonly called winged Pea. 3. Lotus, with conjugated, membranaceous, quadrangular pods, and oblong, oval bractæ. 4. Lotus, with an erect stalk, terminated by a single taper, and an erect pod. 5. Lotus, with single, convex, incurved pods. 6. Lotus, with two narrow, compressed, nodding pods. 7. Lotus, with erect, linear, straight pods, growing in pairs, an erect stalk, and alternate foot-stalks. 8. Lotus, with five-arched, compressed pods, and diffused stalks. 9. Lotus, with three pods,

an erect, herbaceous stalk, and narrow leaves. 10. Lotus, with heads divided in the middle, a shrubby stalk, and shining leaves. 11. Lotus, with hairy heads, an erect hairy stalk, and oval pods. 12. Lotus, with globular heads, an erect stalk, and straight, smooth pods. 13. Lotus, with depressed heads, trailing stalks, and cylindrical pods. 14. Lotus, with heads divided into two equal parts, a very branching, diffused stalk, and woolly leaves. 15. Lotus, with naked heads, and leaves placed by fives, fitting close to the branches; or the *Dorycnium* of Montpellier.

The first, second, third, fourth, sixth, and eighth species are natives of the southern parts of Europe. The fifth sort grows naturally in Sicily, Italy, and Crete.

The seventh and thirteenth species grow naturally in many parts of England, and are rarely admitted into gardens. Their roots are perennial, and difficult to get out where they have had long possession of a piece of ground. The ninth species is an annual plant, which grows naturally in the island of St. James. The tenth and eleventh species are perennial plants, which grow naturally in the south of Europe. The twelfth is seldom cultivated, except in botanic gardens for the sake of variety. The fourteenth and fifteenth species are natives of the south of Europe.

Culture of the LOTUS.

The first, second, third, fourth, fifth, sixth, eighth, fourteenth, and fifteenth species are propagated by seeds, which should be sown where the plants are to remain. When they come up, let them be thinned, and left at the distance of two feet, and afterwards kept clean from weeds.

The ninth, tenth, and eleventh species are propagated by cuttings during the summer season, planted on a bed of light earth, covering them with a bell or hand-glass, and screening them from the sun. In about five or six weeks they will have taken root, when they should be inured to bear the open air, and soon after planted in pots filled with fresh light earth, and placed in the shade till they have taken root: then they may be removed to a sheltered situation, where they must remain till autumn. The ninth species is too tender to live in the open air of this country: the plants therefore must be kept in pots in the winter, and placed in a warm, airy glass-case.

LOVE-APPLE. See the article *Love-APPLE*.

LOVE-APPLE, or **TOMATAS**, *Lycopersicon*, a genus of plants, of which there are seven species. 1. Love-apple, with an herbaceous, unarmed stalk, pinnated, cut leaves, and a smooth round fruit. 2. Love-apple, with a very hairy herbaceous stalk, winged, cut leaves, and a compressed, furrowed fruit; commonly called *Tomatas* by the Spaniards. 3. Love-apple, with an herbaceous, erect, unarmed stalk, oval, angular, indented leaves, with a few spines, and a roundish, furrowed fruit. 4. Love-apple, with an herbaceous, unarmed stalk, leaves unequally winged, whose lobes are bluntly indented, and reflexed spikes. 5. Love-apple, with an unarmed, herbaceous stalk, winged, cut leaves, which are waved, and a longer permanent style to the flower. 6. Love-apple, with an herbaceous, trailing stalk, wing-pointed, smooth leaves, and flowers growing singly from the wings of the stalk. 7. Love-apple, with an unarmed, herbaceous stalk, and winged leaves, which are entire, commonly called *Potatoes*: by the Indians *Batatas*.

The first species is an annual plant, with an herbaceous, branching, hairy stalk, which will rise to the height of five or six feet if supported, otherwise the branches will fall to the ground; they have winged leaves, of a very rank and disagreeable odour, composed of four or five pair of lobes, terminated by an odd one: these are cut on their edges, and end in acute points. The flowers come out from the side of the branches, upon pretty long foot-stalks, each sustaining several yellow flowers ranged in a single long bunch, which are succeeded by round, smooth, pulpy fruit, about the size of a large cherry. There are two varieties of this, one with yellow, and the other with red fruit.

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The second sort is very like the first, excepting the shape and size of the fruit, which differ greatly: for those of the second species are very large, compressed at both ends, and deeply furrowed on the sides.

The third sort is annual; this rises with an erect, herbaceous stalk, a foot and a half high, dividing in several branches, with oval, angular leaves, placed alternately upon pretty long foot stalks, which have one or two short spines upon the mid-rib of the leaves. The flowers are white, and come out singly from the sides of the branches, which are succeeded by red, striated fruit, firmer than those of the other sorts, and about the size of cherries.

The fourth sort is somewhat like the first, but the leaves are unequally winged, having some smaller lobes placed between the large ones; the lobes of this are shorter, broader, and not cut like those of the first, but have some obtuse indentures toward the base. These have not that rank disagreeable odour which the two first have; the fruit of it is not so large as those of the first, but they are round, smooth, and are very late before they ripen here; so that unless the plants are raised early in the spring, they will not produce ripe fruit in England.

The fifth species is annual: this has a very branching herbaceous stalk, spreading out into many divisions, as are not so hairy as the two first; the leaves are composed of a greater number of lobes, which are much shorter and more indented on their edges where they are a little waved. The flowers stand upon very long foot-stalks, which branch out, and support a large number of flowers at the top: these have a longer style than those of the other species, which is permanent, remaining on the top of the fruit; this is also late in ripening the fruit, so that unless the plants are raised early in the spring, the fruit will not ripen in England.

The sixth species has very weak, trailing, smooth stalks, not more than a foot long, with smooth leaves, standing by pairs opposite, which are regularly cut on the sides almost to the mid-rib, in form of a winged leaf: these segments are also indented on their edges and at their points. The flowers, which are of a pale yellow, come out on the sides of the stalks singly, and have large spreading empalements, which are deeply cut at the brim into many acute segments which spread open. The flowers are succeeded by small, roundish berries, a little compressed at the top, of an herbaceous yellow colour when ripe.

The seventh species is the common Potatoe, which is too well known to need any description here; for the manner of cultivating it, see the article POTATOE.

Culture of the Love-APPLE.

The first, second, third, fourth, fifth, and sixth species are propagated by sowing their seeds on a moderate hot-bed in March, and when the plants are come up two inches high, they should be transplanted into another moderate hot-bed, at about four inches distance from each other, observing to shade them until they have taken root; after which they must have a large share of fresh air: for if they are too much drawn while young, they seldom do well afterwards.

In May these plants should be transplanted either into pots or borders near walls, pales, or hedges, to which their branches may be fastened to support them from trailing on the ground, which they otherwise will do, and then the fruit will not ripen; so that where these plants are cultivated for the sake of their fruit, they should be planted to a warm aspect, and the branches regularly fastened as they extend; that the fruit may have the advantage of the sun's warmth to forward them, otherwise it will be late in the season before they are ripe, and they are unfit for use before; but when the plants are brought forward in the spring, and thus regularly trained to the south sun, the fruit will ripen by the latter end of July, and there will be a succession of it till the frosts kill the plants.

LOVE-IN-A-MIST, a species of Passion-flower. See the article PASSION-FLOWER.

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LOVE-LIES-A-BLEEDING, a species of Amaranthus. See AMARANTHUS.

LUDVIGEA, a genus of plants which has no English name; there is only one species of it.

This plant is a native of South America. It rises with an erect, branching stalk a foot high. The leaves are spear-shaped, and placed alternate. The flowers are placed singly at the foot-stalks of the leaves: they are composed of four small yellow petals, and stand upon short foot-stalks. These are succeeded by roundish seed-vessels, which inclose a number of small seeds.

Culture of the LUDVIGEA.

This plant is raised from seed, which must be sown upon a hot-bed in the spring; and when the plants come up, they must be treated in every respect like the Amaranthus.

LUNARIA, a species of Draba, or Madwort. See the article MADWORT.

LUNGWORT, *Pulmonaria*, a genus of plants, ranged by Linnæus among the *pentandria monogynia*, of which there are five species. 1. Lungwort, with the lower leaves spear-shaped. 2. Lungwort, with the lower leaves oval, heart-shaped, and rough; called the Jerusalem Cowslip. 3. Lungwort, with short cups, and spear-shaped, obtuse leaves. 4. Lungwort, with short cups, and the lower leaves somewhat heart-shaped. 5. Lungwort, with short cups, oval leaves, and a branching, trailing stalk.

The first species grows naturally in Switzerland, Sweden, and Hungary; the second in woody places in many parts of Europe. The third is a native of Virginia; the fourth of Siberia; and the fifth grows wild in many parts of England.

Culture of the LUNGWORT.

The first species is an annual plant, and is propagated by seed, which should be sown in autumn soon after they are ripe. When the plants come up they require no other care but to be thinned where they grow too close, and to be kept clear from weeds; and if permitted to scatter their seeds, they will come up better than when sown.

The second, third, fourth, and fifth species have perennial roots, by the parting of which in spring or autumn, they may be propagated; they succeed best in light, sandy ground, and a shady situation.

Cow's LUNGWORT, a species of Mullein. See the article MULLEIN.

LUPINE, *Lupinus*, a genus of plants, ranged by Linnæus among the *diadelphia decandria*, of which there are six species. 1. Lupine, with the cups placed in circles round the stalk, and increased by appendages, with the upper and lower lip of the flower both undivided; or the Giant Lupine. 2. Lupine, with alternate cups, having no appendages, the upper lip indented, and the under one intire. 3. Lupine, with alternate cups, having no appendages, the upper lip entire, but the under one cut into three parts, being the garden, or manured Lupine, with a white flower. 4. Lupine, with cups half whorled, having appendages, and with the upper lip bifid, and the under one almost trifid. 5. Lupine, with cups, having alternate appendages, with the upper lip divided into two, and the under one intire. 6. Lupine, with cups growing in whorls, and having appendages to them, with the upper lips cut into two parts, and the under lips into three; or the common yellow Lupine.

The Lupines are elegant plants, and easily cultivated; they are worthy a place in the best gardens, from the variety they are capable of giving by their singular form and colours: and none deserves notice more than the first species, being the tallest and most specious of them all; the culture of this Lupine is a sufficient direction for that of all the rest.

Giant LUPINE. The root of this plant is composed of many thick, white fibres. The stalk is firm, upright, branched, of a pale green, and lightly hairy: it rises to a yard in height, and is beset with numerous leaves. These have long foot-stalks, pale, and hairy at the main

main stem, and they are of the fingered kind, each composed of five, seven, or more parts, which are joined to the foot-stalks all in one place, and are oblong, narrow, hairy, and of a faint green. The flowers are very elegant, and are disposed to great advantage; they are placed at distances upon the stalk in circular tufts, and open in succession. The colour is changeable, and the same seeds will produce red, blue, and white. Each has its cup formed of one leaf, split into two parts, and hung with a small appendage. The flower is papilionaceous, and regular in that form. The vexillum is rounded and compressed, and has the edges turned back. The alæ are oval, and nearly equal to the vexillum in length; they converge below, and are not fixed to the carina. The carina is split at the base, and falcated upwards, and is narrower than the alæ, and undivided. The filaments are ten; they are formed into two bodies in the lower part, and loose in the upper: they have a bend upwards, and five of them are crowned with oblong, and the other five with roundish buttons. The fruit is a large compressed pod, tough, pointed, and containing in one cell numerous large seeds.

Culture of the Giant LUPINE.

The plant is a native of the warmer parts of Europe, but it acquires its great stature and large flowers by culture. It is an annual, and is raised from seeds. In the beginning of March let a warm, dry, and well-sheltered border be dug up, and plant some good seeds of this Lupine in rows a foot asunder, and at the distance of four inches from one another in the rows. When the plants come up let them be weeded and watered; and when it is seen which are the strongest and finest, let two out of three be taken up, leaving these stout plants: they will thus stand at a foot asunder, and this will be a proper distance for their flowering. The earth must be broke about them from time to time, and they must have frequent waterings.

This will shew all the natural beauty of the plant; and the flowers will be elegant, whether in the bud, in their full blown perfection, or in the first approaches to decay: for the colour often changes in that time, and the different flowers upon the same plant afford a great deal of variety.

Beside these plants raised for the summer flowering, it will be proper to bring up a particular set for seed, as they are very subject to miscarry, owing to the pods not ripening well upon the original plant. This is the case with most of the Giant Lupines sown in spring: the season is too cold for their ripening the seeds by that time they have formed themselves in the pod. The method to have good seed is to sow the plants for that use in autumn: a very warm spot must be chosen for this purpose, perfectly sheltered from the cold quarters, and the soil must be dry. In this place, in August, sow some of these Lupines, and if there do not fall any flowers, encourage the shooting of the plants by watering. They will get so much strength before winter, as to bear all the severity they will be exposed to in such a spot, and flower early the next year: they will ripen their seeds during the heat of summer; and these will never fail to produce perfect and fine plants.

LYCHNIS, *Campion*, a genus of plants, ranged by Linnaeus among the *decandria monogynia*, of which he enumerates seven species. 1. *Lychnis*, with flowers gathered into a pyramid, commonly called Scarlet *Lychnis*. 2. *Lychnis*, with quadrifid petals, and a roundish fruit, commonly called Ragged Robin. 3. *Lychnis*, with intire petals, commonly called the Single Catch-fly. 4. *Lychnis*, with bifid petals, and flowers growing in a corymbus. 5. *Lychnis*, with bifid petals, a stalk divided by pairs, and leaves which are somewhat hairy. 6. *Lychnis*, with male and female flowers, on different plants, frequently called Bachelors Buttons. 7. *Lychnis*, with a swollen cup, the petals of the flower shorter than the cup, and stalks with one flower.

The first species here mentioned is commonly known by the title of Scarlet *Lychnis*, of which there is a

variety with double flowers, which is most esteemed, as it lasts longer in beauty than the single one, so that the latter is not much cultivated, though the flowers of this are very beautiful; and as the plants are so easily propagated by seeds, they may soon be had in greater plenty than those with double flower which do not produce seeds. Of the single sort there are three varieties, the deep scarlet, the flesh colour, and the white, but the first is the most beautiful.

The sort with double flowers is a valuable plant: the flowers are very double, and of a beautiful scarlet colour. This has a perennial root, from which rise three or four stalks, according to the strength of the roots, which in rich moist land grow upwards of four feet high. The stalks are strong, erect, and hairy, with spear-shaped leaves. The flowers are produced in close clusters, sitting upon the top of the stalk; the flowers are double, of a bright scarlet colour: they appear the latter end of June, and in moderate seasons continue near a month in beauty. This was originally produced from the seeds of the single sort.

The second species grows very common by the sides of rivers in most parts of England: it is never admitted into gardens, but there is a variety of it with double flowers, which is very beautiful; these flowers produce no seeds, so are propagated by slips: it is commonly known by the title of Ragged Robin.

The third species is commonly called Red German Catch-fly. This has been found growing naturally upon the rocks in Scotland, and in some places in Wales: it was formerly cultivated in flower-gardens for ornaments, but since this sort with double flowers has been produced, the single has been almost banished out of the gardens. This has long, narrow leaves, which come out from the root without order, sitting close to the ground: between these come up straight single stalks, which in good ground rises a foot and a half high; at each joint of the stalk come out two leaves opposite, of the same form as the lower, but decrease in their size upwards; under each pair of leaves for an inch in length, there sweats out of the stalk a glutinous liquor, which is almost as clammy as birdlime; so that the flies which happen to light upon these places, are fastened to the stalk, where they die, from whence it had the title of Catch-fly. The stalk is terminated by a cluster of purple flowers, and from the two upper joints comes out, on each side the stalk, a cluster of the same flowers, so that the whole form a sort of loose spikes. These appear in the beginning of May, and are succeeded by roundish seed-vessels, which are full of small angular seeds, ripening in July.

The fourth species grows naturally on the Alps in Lapland, and in other cold parts of Europe. The stalk of this is erect, half a foot high, with narrow, spear-shaped leaves. The flowers are produced in a corymbus on the top of the stalk, sitting close together; they are of a purple colour, and the petals are cut in the middle.

The fifth species grows naturally in Siberia. This has a perennial root, from which arise many narrow leaves, sitting close to the ground. The stalks rise a foot high, dividing into branches by pairs. The flowers grow out from the division of the branches, as also at the top of the stalk. They are composed of five white petals, which are divided in the middle, and are succeeded by roundish capsules, filled with small angular seeds.

The sixth species is commonly called Bachelors Button. See the article *BACHELORS BUTTON*.

The seventh species is a native of Portugal. It has a perennial root, from which arise many oblong, narrow leaves; from these come out upright stalks about nine inches high, which divide upwards by pairs: and from the middle of each division comes out a slender foot-stalk two inches long, sustaining one double purple flower at the top, whose petals are very much jagged at their points; the empalements of the flowers are marked with deep purple stripes. From the sides of the stalks there are

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are also foot-stalks coming out at the wings, which for the most part sustain but one flower; these flowers being very double, are never succeeded by seeds.

Culture of the LYCHNIS.

The first species is easily propagated by seeds, which should be sown on a border exposed to the east, in the middle of March. The plants will appear in April, and by the end of June they will be fit to remove, when there should be a bed of common earth prepared to receive them, into which they should be planted at about four inches apart, observing to water and shade them till they have taken root; after which they will require no other care but to keep them clean from weeds till the following autumn, when they should be transplanted into the borders of the pleasure-garden, where they are to continue. The summer following these plants will flower and produce ripe seed, but the roots will abide several years, and continue to flower.

The best method of propagating the double flowers of this sort is to cut off the stalks in June before the flowers appear, which may be cut into small lengths, each of which should have three joints; these cuttings should be planted on an east border of soft loamy earth, putting two of the joints into the ground, leaving one eye just level with the surface. These must be watered, and then covered close with bell or hand-glasses, so as to exclude the outward air, and shaded with mats when the sun shines hot upon them. The cuttings so managed will put out roots in six weeks or two months, when they must be exposed to the open air. These will make good plants by autumn, when they may be transplanted into the borders of the pleasure-garden, where they will flower the following summer.

It has already been observed, that the second species is propagated by slips.

The third species is propagated by parting and slipping of the roots; the best time for this is in autumn, at which time every slip will grow. If this is performed in September, the slips will have taken good root before the frosts, and will flower well the following summer; but if they are expected to flower strong, the roots must not be divided into small slips.

These should be planted on a border exposed to the morning sun, and shaded when the sun is warm, till they have taken root. If the slips are planted in the beginning of September, they will be rooted strong enough to plant in the border of the flower-garden, by the middle or latter end of October. The roots of this sort will multiply so fast as to make it necessary to transplant and part them every year; for if they remain longer, they are very apt to rot.

The fourth and fifth species are propagated by seeds, and also by parting of the roots; they must have a moist soil and a shady situation, otherwise the plants will not thrive. The time for transplanting the plants, and parting the roots, is the same as for the third.

The seventh species is propagated by slips, but coming from a warm country, it is impatient of much cold, and requires a particular treatment, for it does not thrive well in pots, nor will it live through the winter in open borders; the situation in which it thrives best is close to a south wall, in dry undunged earth; for in rich or moist ground the roots will rot, as they also do when they are watered.

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MACAW-TREE, a species of the Palma or Palm-Tree.

It is a native of America, where it rises to the height of thirty or forty feet. The stem is generally larger toward the top than at the bottom. The leaves are winged; the small leaves, or lobes, are long and broad.

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The stalk and leaves are strongly armed with black spines of various sizes in every part. The flowers proceed from the trunk, between the leaves, and are male and female on the same tree. The fruit is about the size of a middling apple, and is inclosed in a hard shell.

Culture of the MACAW-TREE.

It is propagated by seeds in the same manner as the Date-tree, with this difference only, that it requires to be always kept in the bark-bed of the stove.

MAD APPLE. See *Mad Apple*.

MADWORT, *Alyssum*, a genus of plants, ranged by Linnæus among the *tetradynamia filiculosa*, and of which he distinguishes eleven species. 1. Madwort, with old branches, and naked spines. 2. Madwort, with shrubby, diffused branches, and prickly punctuated leaves. 3. Madwort, with spear-shaped, linear, acute, entire leaves, and a trailing, perennial stalk. 4. Madwort, with shrubby stalks, flowers growing in panicles, and spear-shaped, waved, entire leaves. 5. Madwort, with an erect stalk, hoary, spear-shaped, entire leaves, and flowers disposed in a corymbus. 6. Madwort, with herbaceous, diffused stalks, narrow, hairy leaves, and compressed pods. 7. Madwort, with an erect, herbaceous stalk, sessile, oval, compressed, plain pods, and pointed petals. 8. Madwort, with an herbaceous stalk, spear-shaped, indented leaves, and inflated pods. 9. Madwort, with an herbaceous, erect stalk, hoary, spear-shaped, entire leaves, and inflated pods. 10. Madwort, with linear, indented leaves, and inflated, angular, acute pods. 11. Madwort, with hoary, indented leaves, and four double-forked stamina.

All these species are natives of the south of Europe. The four first species are shrubby plants, and the others are annual and biennial.

Culture of this MADWORT.

The first, second, third, and fourth species are propagated by sowing the seeds in March, in a light, sandy soil; or by planting cuttings in April or May, which should be shaded in the heat of the day till they have taken root, and gently watered.

The remaining sorts are propagated by seeds, which should be sown soon after they are ripe, in a dry soil, or upon lime-rubbish; and if their seeds are permitted to scatter, a new succession of plants will arise without any farther care.

MADWORT, *Draba*, a genus of plants, ranged by Linnæus among the *tetradynamia filiculosa*, of which there are six species. 1. Madwort, with a single, naked stalk, and very entire, spear-shaped leaves. 2. Madwort, with naked stalks, and cut leaves. 3. Madwort, with a naked stalk, and pinnated, trifoliate leaves. 4. Madwort, with a branching stalk, and heart-shaped, indented leaves embracing the stalks. 5. Madwort, with a branching stalk, and oval, indented leaves growing close to the branches. 6. Madwort, with many hoary leaves on the stalks, and oblique pods, sometimes called Lunaria.

These plants are natives of many parts of Europe, and some of them grow naturally in England.

Culture of this MADWORT.

The first and third species are easily propagated by parting of the heads in autumn; they should have a moist soil, and a shady situation, and require no other care but that of being kept free from weeds.

The second and fourth species are never admitted into gardens.

The fifth and sixth species are propagated by seeds, which must be sown in autumn, upon a shady border, and the plants will come up without any farther trouble.

MAHOGANY-TREE, according to some authors a species of Cedar, but by others considered as a distinct genus.

It is a native of the warmest parts of America, where it grows to a great height. The leaves are winged like those of the Ash, but shorter and broader at their base, where they adhere to the mid-rib by very short foot-stalks. The flowers are succeeded by a fruit which grows erect, upon long foot-stalks.

Culture

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Culture of the MAHOGANY-TREE.

It is propagated by seeds, which are best when procured from the Bahama islands; these should be sown in small pots filled with light sandy earth, and plunged into a hot-bed of tanners-bark, giving them a gentle watering once a week. If the seeds are good the plants will appear in a month or five weeks; when they are about two inches high, a number of small pots should be filled with light earth, and plunged into the tan-bed for two days, that the earth may be warmed: then the young plants should be shaken out of the pots they are in, and carefully separated, so as not to injure their roots, and each planted in one of the pots prepared for them, observing to shade them till they have taken fresh root: after which they must be treated in the same manner as other tender plants from hot climates.

MAIDEN-HAIR, *Adiantum*, a genus of plants, ranged by Linnæus among the *cryptogamia filices*, of which he enumerates fifteen species, but one of these only is cultivated in gardens, viz: Maiden Hair, with decomposed leaves, the lobes alternate, and the wings wedge-shaped, lobated, and standing on foot-stalks; or the true Maiden Hair.

This plant is a native of the southern parts of Europe, and usually grows out of the joints of walls, and fissures of rocks.

Culture of the MAIDEN HAIR.

It is propagated by planting it in pots filled with gravel and lime-rubbish. The pots must be sheltered under a frame in winter, otherwise the plants are often killed by the frost.

MALABAR NUT, a species of *Justicia*. See the article *JUSTICIA*.

MALLOW, *Malva*, a genus of plants, ranged by Linnæus among the *monadelphia polyandria*, and of which he distinguishes fifteen species, but most of them being natives of this country, are seldom admitted into gardens: it is therefore unnecessary to mention them, but the two following deserve a place in every collection.

1. Mallow, with smooth, jagged, and somewhat heart-fashioned leaves. 2. Mallow, with heart-shaped, crenated leaves, and flowers growing singly from the sides of the stalks, and in spikes at the top.

The first species is a shrub of very handsome growth, with large and graceful leaves, and very showy flowers.

The root is woody, spreading, and full of fibres. The stem is firm, thick, brown, and a little hairy. The branches are numerous, and the leaves stand very close on long, brown foot-stalks; they are broad, waved, indented at the edges, and of a greyish green. The flowers rise from the bosoms of the leaves, and grace not only the top of the plant, but in a manner the whole; they are large, and of an elegant bright red, with purple bottoms. The flower is composed of five petals, which are united at their bases: it stands in a double cup, the outer one consisting of three leaves, and the inner of one, divided at the end into five segments. In its centre stand numerous filaments, free and loose at their tops, but at the bottom united into a cylinder. The fruit which succeeds the flower is composed of numerous cells, each containing one seed.

The second species is a native of the West-Indies. The stalk is smooth. The leaves are heart-shaped, and stand upon foot-stalks. The sides and tops of the branches are ornamented with flowers of a delicate pale blue. These appear in June, and the seeds ripen in autumn.

Culture of the MALLOW.

These species are both propagated by seeds, which early in spring should be sown on a hot-bed; the plants will come up freely, when they must be transplanted on a second hot-bed.

When they have acquired some strength, they must be removed into pots of a middling size, filled with the following compost:

A barrow of earth from a common, with a bushel of pond-mud, and a peck of sand: these should be mixed in November, and laid in a heap till wanted.

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When the plants are settled in the pots by a gentle watering, plunge them into a bark-bed, burying the pots half way in the tan; let them be shaded at first, and afterwards by degrees hardened a little to the air. When the glasses have been removed once or twice in the middle of the day, let the pots be taken out of the tan, and placed among the exotics, which at that season enjoy the free air: there let them stand the summer, and in autumn be removed with the rest into the shelter of the green-house. They will flower the second, if not the first year.

Bastard MALLOW, *Malope*, a genus of plants, ranged by Linnæus among the *monadelphia polyandria*, and of which there is but one species.

The whole plant has greatly the appearance of the common Mallow, but differs from it in having the cells collected into a button. The branches spread, and lie flat upon the ground, extending themselves a foot each way.

Culture of the Bastard MALLOW.

It is propagated by seeds, which should be sown in August, upon a warm border, where the plants will come up before winter, when they must be transplanted into small pots, and sheltered under a hot-bed frame. In summer they should be placed with other hardy exotics in a sheltered situation, where in warm seasons they will produce seeds.

Jews MALLOW, *Corchorus*, a genus of plants, of which there are five species. 1. Common Jews Mallow. 2. Jews Mallow, with heart-shaped, sawed leaves, and oblong, swelling, furrowed capsules. 3. Jews Mallow, with roundish, depressed capsules, which are rough. 4. Jews Mallow, with a yellow flower, and fruit like a clove. 5. American Jews Mallow.

The first species is a native of both Indies. It is an annual plant, which rises about two feet high, dividing into several branches. The leaves are of different sizes and forms: some are spear-shaped, others oval, and some almost heart-shaped; they are of a deep green, and slightly indented on their edges. The flowers are composed of five small yellow petals, and are succeeded by capsules, filled with angular, greenish seeds.

The second species is a native of the West-Indies. It rises with a strong, herbaceous stalk, two feet high, dividing upwards into two or three branches. The leaves are heart-shaped, sawed on their edges, and stand upon long foot-stalks. The flowers resemble those of the former species, and are succeeded by seeds in the same manner.

The third species has a slender, herbaceous stalk, about three feet high, which sends out several weak branches: at each joint is placed one leaf, of an oblong heart-shape, ending in a long acute point, sawed on their edges, and standing upon short foot-stalks. The flowers grow singly on the sides of the branches; they are small, and succeeded by short, roundish seed-vessels, filled with angular seeds. It is a native of both Indies.

The fourth species, which is also a native of both Indies, rises about two feet high, and divides into many small branches. The leaves are heart-shaped, and crenated on their edges. The flowers are very small, of a pale yellow, and are succeeded by swelling, rough, four-cornered seed-vessels, about an inch long, flattened at the top, where there are four horns, which are reflexed, and have some resemblance in shape to the clove.

The fifth species is a native of Carthage. It rises about three feet high, sending out several weak side-branches. The leaves are long, narrow, and sawed on their edges. The flowers are small, and of a pale yellow; they are succeeded by narrow compressed pods, filled with small angular seeds.

Culture of the Jews MALLOW.

All these plants are too tender to thrive in the open air of our climate; therefore their seeds must be sown on a hot-bed in the spring, and when the plants are fit to remove, they should be transplanted on a fresh hot-bed, and when they are well rooted in it, they must have free air admitted to them every day, to prevent their being drawn up weak.

When they have obtained some strength they should be each transplanted into a separate pot, and plunged into a hot-bed, where they must be shaded till they have taken root. In June they should be gradually inured to the open air, when part of them may be shaken out of the pots, and planted in a warm border, where, if the season proves hot, they will perfect their seeds; but as these sometimes fail, it will be proper to preserve one or two plants in a glass-case, where they may be sheltered from bad weather, and from these good seeds may always be obtained.

Indian MALLOW, *Sida*, a genus of plants, ranged by Linnæus among the *monadelphia decandria*: of which there are ten species. 1. Indian Mallow, with heart-shaped, oval, sawed leaves, bristly stipulæ, and spiny stems. 2. Indian Mallow, with spear-shaped, rhomboidal, sawed leaves. 3. Indian Mallow, with orbicular, plaited, sawed leaves. 4. Indian Mallow, with heart-shaped, angular, sawed, hairy leaves. 5. Indian Mallow, with spear-shaped, heart-shaped, intire leaves. 6. Indian Mallow, with roundish, heart-shaped, pointed, intire leaves. 7. Indian Mallow, with roundish, heart-shaped, pointed, crenated leaves. 8. Indian Mallow, with heart-shaped, roundish, crenated, woolly leaves, and inflated capsules, with many cells. 9. Indian Mallow, with angular leaves, the inferior ones heart-shaped, and the higher pandura-shaped. 10. Indian Mallow, with heads consisting of three leaves growing upon foot-stalks, and seven flowers.

These plants are natives of the Indies. They are all annual, except the tenth species, which is perennial.

Culture of this Indian MALLOW.

All these species are propagated by seeds, which should be sown the beginning of April upon a moderate hot-bed. When the plants are fit to be removed let them be transplanted on a second hot-bed, and placed at the distance of four inches every way; they should be shaded from the sun till they have taken new root, and must have a large share of air admitted to them in mild weather. By degrees they must be inured to the open air, and about the beginning of June they are to be taken up with balls of earth to their roots, and planted in a warm sheltered part of the garden, at about the distance of three feet from each other, observing to shade and water them till they have taken new root, after which they will only require the common care of being kept clean from weeds.

Indian MALLOW, *Urena*, a genus of plants, ranged by Linnæus among the *monadelphia polyandria*, and of which there are three species. 1. Indian Mallow, with angular leaves. 2. Indian Mallow, with sinuated, hairy, many-pointed leaves. 3. Indian Mallow, with spear-shaped, heart-shaped, undivided, sawed leaves, and a trailing stalk.

The first species of this plant is a native of China. The second sort grows naturally in India: and the third on the mountains of China.

Culture of this Indian MALLOW.

All these species are propagated by seeds, which should be sown on a hot-bed early in the spring. When the plants are fit to remove, let them be transplanted into pots, and plunged into a fresh hot-bed, to bring them forward: after which let them be placed in the stove, or under a deep frame, till they have ripened their seeds.

Marsh MALLOW, *Althæa*, a genus of plants ranged by Linnæus among the *monadelphia polyandria*, of which there are three species. 1. Marsh-mallow with single woolly leaves, or the common Marsh-mallow. 2. Marsh-mallow with the lower leaves palmated, the upper ones digitated, and shrubby stalks. 3. Marsh-mallow with trifid, hairy, prickly leaves.

The first species grows naturally in moist places in England, Holland, France, and Siberia. It has a perennial root, and an annual stalk. The second species is a native of Hungary, and Italy. The third species grows naturally in France, Italy, and Spain.

Culture of the Marsh-MALLOW.

The first species is propagated either by seeds or parting

of the roots: when by seeds they should be sown in spring: but the best time for parting the roots is in autumn when the stalks decay. It will thrive in any soil or situation, but grows larger in moist places. The plants should not stand nearer than two feet to each other. The second species is propagated by seed. The seed should be sown in the spring, in the place where the plants are to remain. If that is not done, let them be transplanted young; they must have a sheltered situation and a dry soil. The third species is propagated by seeds sown in April, in the place where the plants are designed to remain.

Rose-MALLOW, a species of the Holyhock. See the article HOLYHOCK.

Syrian-MALLOW, a species of the Hibiscus. See HIBISCUS.

Tree-MALLOW, a species of Lavatera. See the article LAVATERA.

Yellow-MALLOW, *Abutilon*, a genus of plants, of which there are eight species. 1. The common Yellow-mallow. 2. The Indian Yellow-mallow. 3. American Yellow-mallow with oblong heart-shaped leaves, and the foot-stalks of the flowers longer than those of the leaves. 4. Yellow-mallow with oval, heart shaped, rough leaves, and flowers disposed in a loose spike at the ends of the branches. 5. Yellow-mallow, with downy, roundish, heart-shaped leaves, having foot-stalks, and swollen covers to the fruit: which are crenated and turn backwards. 6. Yellow-mallow, with heart-shaped pointed leaves, which are notched on their edges, fitting close to the stalks, and a downy swollen cover to the fruit, having a jointed foot-stalk. 7. Yellow-mallow, with smooth halbert-pointed leaves and flowers. 8. Indian Mallow with sharp-pointed lobed leaves, woolly on their under side, flowers terminating the branches, and a downy shrubby stalk.

The first, fourth, and eighth species, are most worthy description.

The first sort is a native of many parts of North America. It is an annual plant, which in good ground will rise four or five feet high, sending out many branches: the leaves are soft to the touch, the flowers small, of a yellow colour, so make no great appearance.

The fourth sort grows naturally on moist land in the West Indies, where it rises with a shrubby stalk, five or six feet high, sending out branches on every side. The leaves are rough and heart-shaped. The flowers are disposed in loose spikes at the ends of the branches, they are yellow, and like those of the mallow.

The eighth sort is a native of the Bahama Islands. It rises with a shrubby stalk to the height of seven or eight feet: the stalks are covered with a whited down, having four or five lobes ending in sharp points, which are downy on their under side; the flowers are purple, and grow in loose clusters at the ends of the branches.

All the other species are annual plants, which grow naturally in several parts of the West Indies.

Culture of the Yellow-MALLOW.

The first species is propagated by seeds, which must be sown in the spring, on a border where the plants are to remain. They will require no other care, than to be kept clean from weeds, and thinned where they grow too close.

The second, third, fifth, sixth, and seventh species are propagated by seeds, which should be sown in spring on a moderate hot-bed, and when the plants are fit to remove, they should be transplanted on another hot-bed, to bring them forward, but as the weather becomes warm, they must by degrees be inured to the open air; and toward the middle of May, if the season proves favourable, they must be taken up with balls of earth to their roots, and planted in the open borders, where they must be shaded and watered till they have taken new root; after which they will only require to be kept clear from weeds. In June they will begin to flower, and there will be a succession of flowers, till the cold in autumn puts a stop to them. The seeds should be gathered as they ripen, otherwise they will scatter.

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The seeds of the fourth species must be sown on a hot-bed, and when the plants come up, they must be removed each into a separate pot, and placed in a moderate warmth, where they must always continue, otherwise they will not thrive in this country. The plants will continue three or four years, and produce flowers and fruit. The eighth species is propagated by seeds, which must be sown on a moderate hot-bed. When the plants are fit to remove, they must be put into pots, and gradually inured to the open air, to which they must be exposed in summer; but in winter they are to be placed in a good green-house to secure them from frost.

MAMMEE-TREE, *Mammea*, a genus of plants, of which there is but one species.

This tree is a native of the West-Indies, where it grows to the height of sixty, and sometimes seventy feet. The leaves are large, stiff, and continue green all the year. The fruit is as large as a man's fist: when ripe it is of a yellowish green colour, and is very agreeable to the taste.

Culture of the MAMMEE-TREE.

It is propagated by planting the stones, which should be obtained as fresh as possible from the West-Indies: these should be put into pots, and plunged into a hot-bed of tanners-bark. In about two months the plants will appear above ground: after which, if the weather is warm, the glasses of the hot-bed should be raised to let in the fresh air. In about three months more the roots of the plants will have filled the pots, when they should be carefully taken out, and the outer shell of the nut taken off with all possible care not to injure the plants: then they must be new potted, and plunged again into the bark-bed, where they must be watered and shaded till they have taken fresh root: after which they should have air and water in proportion to the warmth of the season.

In this bed they may remain till Michaelmas, when they must be removed into the bark-stove, where they must be constantly kept.

MANDRAKE, *Mandragora*, a genus of plants, ranged by Linnæus among the *pentandria monogynia*: of which there is only one species.

The root of this plant is long and thick, simple, or divided, and hung with many fibres; from this rise numerous and vast leaves, long, moderately broad, waved at the edges, pointed, and of a dusky green: among these spring up a number of little foot-stalks, slender, reddish, three inches high, each at its summit bearing one large flower. This is of a whitish hue, more or less tinged with a deep purple, succeeded by a round or oblong fruit. The cup in which the flower is placed is hollowed as a bell, formed of one piece cut into five parts, and ribbed. One petal forms the body of the flower, but is deeply cut into five segments. The fruit is divided into two cells, and has, in a fleshy receptacle convex on each side, a number of kidney-shaped seeds.

The whole plant has an unpleasing smell, and a gloomy aspect. The root, concerning which so many stories have been told, and however strange believed, differs in nothing materially from other long roots. Naturally it is single, and resembles nothing more than a carrot, except in colour. Sometimes it is divided, or forked, as we see radishes, and in this state it has been supposed to represent a human body and legs.

Culture of the MANDRAKE.

The plant is hardy, and almost universal. It grows wild in the warmest parts of Europe, Greece, and Egypt. In places where it is a native, it thrives best in a light, deep soil, and open exposure: and in such places, and such soil we must raise it from seed, which it ripens freely with us: but this must be done in the garden where the plants are to remain: for one great article in the perfecting it, is, never to remove it.

Let a small pot, in some open part of the garden be selected, and the mould being dug out four feet deep, let the place be filled with any one of the light composts, screening it first, that there may remain no lumps or stones in it to split the root: for though the imaginary resemblance of the human form depends upon the divi-

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ding of the root, the perfect flourishing of the plant will be owing to its running down to a great depth single and uninterrupted. On such a bed of earth let some seeds of the Mandrake, saved from a strong plant, and dried carefully, be sown in the beginning of September: let the bed be weeded and watered occasionally; and when the plants are so far advanced that it can be seen which are the strongest and most promising, let the weak ones be taken up, and these left at two feet and a half distance: they will after this require only the common care of weeding and watering, and they will flower annually, and produce ripe fruit in full perfection. The depth to which the root strikes, prevents all necessity of renewing the superficial part of the soil.

MAPLE-TREE, *Acer*, a genus of plants, ranged by Linnæus among the *polygamia monœcia*, and of which there are nine species. 1. Maple-tree, with heart-shaped, undivided, sawed leaves, obsolete lobes, and flowers growing in bunches. 2. Maple-tree, with leaves divided into five lobes, unequally sawed, and flowers growing in bunches. 3. Maple-tree, with leaves divided into five indented lobes, of a scarlet colour underneath, and with single foot-stalks to the flowers; collected together. 4. Maple-tree, with leaves divided into five palmated segments, acutely indented; or the Sugar Maple. 5. Maple-tree, with smooth, sharp-pointed leaves, acutely indented, and flowers growing in a corymbus. 6. Maple-tree, with leaves divided into three lobes, sharply sawed, and flowers growing in bunches. 7. Maple-tree, with lobated, obtuse, emarginated leaves; or the common Maple. 8. Maple-tree, with leaves divided into three entire lobes. 9. Maple-tree, with compound leaves, and flowers growing in bunches.

The first species grows naturally in Tartary. The second is a native of the mountains of Switzerland and Austria. The third of Virginia and Pennsylvania. The fourth and sixth of Pennsylvania. The fifth grows naturally in the northern: and the seventh in the southern parts of Europe. The eighth sort is a native of Montpellier and Crete: and the ninth of Virginia.

Culture of the MAPLE-TREE.

The several species may be readily propagated by seeds, which should be sown soon after they are ripe upon a bed of light earth. When the plants come up, let them be kept clean from weeds: and the autumn following they must be transplanted into a nursery, at the distance of two feet, in rows three feet asunder; and here they may remain till they are large enough to be transplanted into the places where they are to stand.

The North American kinds may also be propagated by laying down the young branches early in the spring, giving them a little slit at a joint, by which means they will take sufficient root in a twelvemonth to be transplanted out.

MARCH, the third month in the year.

In the *Flower-garden*. You must carefully destroy the weeds, which about the beginning of this month rise on the borders, and hurt the roots of flowering plants; and when the largest weeds are taken off, the surface must be broke, and the small ones destroyed with a trowel. After this let the borders be laid smooth, and a quarter of an inch of fine fresh mould sifted over it once in three days; if the season be dry, give a gentle watering in the morning, two hours after sun-rise.

Such roots as are not in good condition, should now be removed and replaced by others. Plant, if required, biennial and perennial flowers about the beginning of this month; take off the common hoops from the beds of *Ranunculus* and *Anemonies*, and fix in their place some that are much higher, and let the covering they are intended to support never be used but when it is wanted; not in all nights, but only such as are frosty: and if the days be severe, let it be kept on, except two hours at noon; dig up little patches in several borders for tufts of hardy annual flowers: rake the surface even, scatter on the seeds, and sift a light covering of mould over them: let the grass-walks be cut at the edges, and put in order, and all the borders must be kept clean. About the middle of this month look to the beds of valuable flowers.

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The tender annuals sown upon hot-beds will be fit to transplant, the second hot-beds should be ready for them. About the end of this month sow a second parcel of those annuals, which are to be raised where they are to remain.

In the *Seminary*. Dig a piece of ground for sowing the berries of ever-greens: sow American trees which bear the open air, and dig up the earth between the rows of young trees; look over those trained for conspicuous parts of the garden, and for other purposes, where they will be in sight; trim up those intended for heads, and tie carefully the young shoots of such as you would have rise straight to stakes. Sow the biennial and perennial plants, to stand in the seminary till the autumn before their flowering: the ground must be well dug, and all roots of perennial weeds picked out. Continue sowing biennial and perennial flowers. Remove yews, hollies, and cypresses, where they stand too close, planting them to a greater distance, if they are not yet wanted in the garden, or ready for it. Sow the seeds of the fir and pine kinds. Plant cuttings of exotic trees and shrubs. Look carefully over the beds where you sowed the seeds, and fruits of trees and shrubs the preceeding autumn; many will be now up, and you must cherish and protect them: if the weather is too dry refresh it with water: let no weeds stand among them; bait traps for vermin, and stick up scare-crows to keep off birds.

In the *Fruit-garden*. Finish pruning of the peach and nectarine kinds: and when this is done, and they are carefully nailed to the wall, dig the earth in the borders. This is a proper time for pruning new-planted trees, because what parts are dead will now be seen distinctly, and must be cut out. The strawberry-beds should have a careful and thorough dressing about the beginning of this month. Dress also the gooseberry and currant-bushes. Fruit-trees may be yet planted, but with the more care as the season is advanced. Prune the heads of trees left off in the autumnal plantation. Care must be taken of the trees planted in the preceding October: their heads being cut down, the earth must be kept from drying about their roots: let a quantity of turf be laid about the root of the tree, and to two feet distance all round it. Plant vines about the middle of this month. Take care the earth does not grow too dry about the roots of the new planted vines. Let the raspberry-beds toward the end of the month be well dug.

In the *Kitchen-garden*. Dig a bed about the beginning of this month for a second sowing of celery. Sow more lettuces, and let them be of the best kinds. Dig a piece of light mellow ground for the Dutch parsley. Weed early spinach, and thin the plants to four inches distance. The gardener should now examine the heat of the cucumber and melon beds, and if it declines, pile up fresh dung in large quantities against the sides. Let a small quantity of peas and beans be put into the ground about the middle of this month, for the means of a continual supply during the season. Dress the asparagus-beds with a three-pronged fork, slant, and with short tynes. Sow a crop of endive on a rich warm piece of ground about the middle of this month. It will now be proper to prepare for a second crop of cucumbers and melons. French-beans must be planted this month with care. The cauliflower-plants raised upon hot-beds, will, about the end of this month, be of a proper bigness for transplanting. Sow red cabbage; sow more parsneps and carrots; sow also more leeks and onions.

In the *Green-house and Stove*. Take care that every plant be clean from filth, and not a dead leaf left: admit air more freely, chusing the middle of mild days, and let the waterings be encreased in the same proportion as the air is admitted. Reduce the heads of myrtles and other trees, where they are too luxuriant, and let the stems be washed clean, the mould upon the surface of the pots taken off, and fresh mould put in its place, and when thus prepared let them have a moderate warmth to promote the shooting. Regulate the green-house according to the weather; in the middle of mild days the glasses must be opened a little. Let the temperature of the air

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in the stove be examined, and as the severe cold decreases let the fires be less. Stir up the bark-beds where they are grown uneven, or have lost their natural warmth, and the plants will require cleaning and watering; let no filth remain upon any part, nor any dead leaves or decaying branches, and let the earth be stirred upon the surface of the pots, and some fresh mould added.

MARIGOLD, *Calendula*, a genus of plants, ranged by Linnæus among the *syngenesia polygamia*, and of which there are seven species. 1. Marigold, with narrow, spear-shaped leaves, and prickly seeds; or the least Marigold. 2. Marigold, with boat-shaped, prickly seeds in the border, and those in the center bicorned. 3. Marigold, with spear-shaped, indented leaves, and slender foot-stalks. 4. Marigold, with sinuated, indented, spear-shaped leaves, and a naked stalk. 5. Marigold, with indented, spear-shaped leaves, and the upper part of the foot-stalk swelling. 6. Marigold, with narrow, entire leaves, and a naked stalk. 7. Marigold, with obverse, oval leaves, which are indented, and a perennial shrubby stalk.

The first sort grows naturally in the south of France, Spain, and Italy: it rises with a slender, branching stalk, which spreads near the ground. The leaves are narrow, spear-shaped, and hairy: they half surround the stalk at their base. The flowers are produced at the extremity of the branches upon long, naked foot-stalks. These are very small, and of a pale yellow colour: the seeds are long, narrow, and on their outside armed with prickles.

The second species is the common Marigold, which is cultivated for use in gardens: this is so well known as to require no description; of this there are the following varieties: the common single, the double flowering, the largest very double flower, the double lemon-coloured flower, and the greater and smaller chiding Marigold.

These varieties are supposed to have been originally obtained from the seeds of the common Marigold, but these differences continue, if the seeds are properly saved; but the two chiding Marigolds, and the largest double, are subject to degenerate, where care is not taken in saving their seeds.

The third species grows naturally at the Cape of Good Hope. This plant is annual, and perishes soon after the seeds are perfected.

The lower leaves are oblong, spear-shaped, and deeply indented on their edges. The stalks are produced on every side the root which decline towards the ground, with leaves from the bottom to within two inches of the top. The upper part of the stalk is very slender, upon which rests one flower, shaped like those of the common Marigold, having a purple bottom: and the rays of the flower are of a violet colour on their outside, and of a pure white within: these open when the sun shines, but shut up in the evening, and remain so in cloudy weather.

The fourth, fifth, sixth, and seventh species are likewise natives of the Cape of Good Hope.

The fourth species is also an annual plant, and has much the appearance of the former, but the leaves are more deeply indented on their edges; the flower is a little smaller, and the outsides of the rays are of a fainter purple. The seeds of this are flat and heart-shaped, but those of the former are long and narrow.

The leaves of the fifth species are much longer than those of either the former sorts, and broader at the end: they are regularly indented near the root, but those on the stalks have but few and shallow indentures. The stalks of this sort are much longer and thicker: and at the top, just below the flower, swells larger than it is at bottom. The flowers are the same colour as the former sorts.

The sixth species is a perennial plant, which divides near the root into several tufted heads, which are closely covered with long grassy leaves. From between the leaves rise naked foot-stalks, about nine inches long, sustaining one flower at the top, about the size of the common Marigold; the bottom is purple, as are the rays on the outside, but of a pure white within; these expand

expand when the sun shines, but always close in cloudy weather, and in the evening.

The seventh species has a slender, shrubby, perennial stalk, which rises to the height of seven or eight feet, but requires support: it sends out a number of weak branches, which hang downward. The leaves are oval, of a shining green on their upper side, but paler underneath. The flowers grow at the ends of the branches upon short foot-stalks.

Culture of the MARIGOLD.

If the seeds of the first species are permitted to scatter there will be a supply of young plants without any trouble.

In order to preserve the varieties of the second species, care should be taken when they are in bloom, to pull off all single flowers as soon as they appear, that they may not impregnate the others with their farina. The seeds must be sowed from the largest and most double flowers, and always observe to sow the chiding sort by itself in a separate part of the garden, and to save the seeds from the large centre flowers only.

The seeds thus saved should be sown in March or April, where the plants are to remain; when they come up they will require no other culture than to be kept clean from weeds, and thinned to the distance of ten inches asunder, that their branches may have room to spread.

The seeds of the third, fourth, and fifth species should be sown in spring, in the borders of the garden where the plants are designed to remain. They will require no other care than to be kept clear of weeds: and if their seeds are permitted to scatter, the plants will come up without any farther trouble.

The sixth species seldom produces good seeds in England: but it is easily propagated by slips taken off from the heads, and planted any time in summer in pots filled with light fresh earth, which may be plunged into a very moderate hot-bed to forward their putting out roots: or the pots may be sunk in the ground up to their rims, and covered with a melon-glass. They must be shaded in the heat of the day, and frequently, but gently watered.

When they have got roots they must be planted into separate small pots filled as before, and placed in a shady situation till they have taken fresh root, when they may be placed in the open air in a sheltered situation: here they may remain till autumn, and then removed into a dry, airy glass-case for the winter season, or under a common hot bed frame.

The seventh species is easily propagated by cuttings, which may be planted any time in summer in a shady border. In five or six weeks they will have taken root, when they should be carefully taken up, and each put into a separate pot, and placed in the shade till they have taken fresh root, after which they may be set out with other hardy exotics in a sheltered situation, where they may remain till the frosts begin, when they must be removed into the green-house, placing them near the windows that they may enjoy the free air, for they only require protection from frost.

African or French MARIGOLD, Tagetes, a genus of plants, ranged by Linnæus among the *syngenesia polygamia superflua*: of which there are three species. 1. Marigold, with a diffused, subdivided stalk, commonly called French Marigold. 2. African Marigold, with a single, erect stalk, and naked foot-stalks, bearing single flowers. 3. African Marigold, with a single, erect stalk, and ically foot-stalks, bearing many flowers.

Each of these species have many varieties arising from culture.

The first species is a native of South America and some parts of Africa. We distinguish it by the title of French Marigold, the French having first taught us to raise it in our gardens.

The root is formed of innumerable fibres, joined to an oblong central part. The stalk is two feet and a half high, weak branched, biown, and spreading. The leaves are large, of a deep green, and beautifully pinnated, the pinnæ being placed on slender ribs, and in themselves narrow, oblong, serrated sharply, and sharp-pointed. The flowers rising on small stalks from the

bosoms of the leaves, and terminating all the branches, cover the plant in vast profusion; and if gathered before they fade, or set for seed, others will succeed in greater number, and the plant continue flowering in all its lustre till the latter end of November, and longer, if frosts do not destroy the root.

The flower is large, and in its natural state single, nor is it then without its beauty, the colour being mixed, of an extreme dark, purplish brown, and a gold yellow: but by culture it becomes double, striped, and party-coloured; in some plants the petals of these double flowers roll themselves into quills, but this is not to be encouraged; it is a great beauty in the African, or larger kind, because that has no great variety of colouring: but in this species the gardener's art should be employed to streak and stripe the flowers: and not to twist up, but display the petals flat or waved, to shew that singular elegance.

The root of the second species has innumerable fibres. The stalk is upright, firm, and a yard high: it does not spread out into wild branches as the former sort. The leaves are large and pinnated: their colour is a dusky though not a dark green; and the pinnæ are oblong, and sharp-pointed, somewhat broad and serrated. The flowers are large, numerous, naturally single, and of a pale yellow. A richer soil deepens their colour, so that they vary from the palest lemon to the deepest orange. The petals, which are multiplied innumerable by the gardener's art, are rendered from their plain natural form, waved, curled, and tubular; this last is their most beautiful appearance, and in this species it is greatly to be encouraged: for as it has not that variety of stripes which is in the preceding, this elegant form is to be consulted.

The third species is a plant of no great beauty, therefore seldom admitted into any other than botanic gardens.

Culture of the African and French MARIGOLD.

These plants are annual, so must be raised from seeds every spring. The procuring these good is the first article: and for this purpose when the plants are in full bloom, the gardener should mark the best striped of the French Marigold, and the largest and most quilled of the African. When a few fine flowers of these have been fixed upon for seed, let all the rest be cut off in the bud, that the whole strength of the plant may be employed in perfecting the seed. Every day, two hours before sunset, let these plants be watered. Observe to tie them up to stakes that the wind may not rock them at the root. When the seeds are near ripe, leave off the waterings, and let them harden upon the plant as the root decays. After this, in the middle of a dry day, cut the heads carefully off, and lay them upon a papered shelf in an airy room.

In the last week in February let them be sowed upon a hot-bed of a moderate heat, and well covered with rich garden-mould.

When the seeds are sown, make the following compost: mix equal parts of earth from under the turf in a rich pasture, and good mellow garden mould: add a small quantity of well rotted dung, and to a load of this put two bushels of coarse sand.

When the plants come up let them by degrees be inured to the air: and when they have grown to a finger's length in height, let another hot-bed be prepared for them in some sheltered part of the ground, and not covered with frames, but let hoops be placed over it at small distances, that a mat or cloth may be drawn over. Cover this seven inches deep with the compost, and then draw lines lengthways and across at eight inches distance: open holes in the centre of every square, and carefully set in one plant. Water them well, and draw a mat over the hoops, letting it fall close at the ends. Thus let them stand till rooted, then by degrees raise the mats in the middle of the day, and harden them gradually, for if they are drawn up too close, they are often ill-shaped, and subject to be stunted when brought out into the open air, the change being too sudden: but by the above method they will be inured to their proper situation

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situation without any violence; the heat of the bed will decrease as they grow up, and they will be day by day more exposed, till in the middle of a warm cloudy day the mat may be wholly taken off, and put on no more.

As soon as the plants are ready for removal, open holes in the borders where they are to stand. Make two of these holes in each place, near one other, and set a plant upright in each, filling them up with the compost instead of the mould that was dug out, sifting a little of the common mould over it, that the border may all look of one colour. Water the plants carefully, and they will soon be well rooted, and make their shoots for flowering. Notwithstanding the seeds were all from double flowers, there will be many single, which must be pulled up and thrown away.

When one of the two plants in a place is single, and the other double, the single one being taken up, there remains the other for flowering, and no more trouble is required. Where they are both single, both must be pulled up, and one from some place where they are both double, planted in the room. There will still remain some places where both the plants are double, one from these must be set in a pot filled with the compost.

When the plants are thus all disposed, the gardener must thrust into the ground near each a short firm stake. Let it stand above the ground half the height of the plant, and tying the stalk carefully to it, let it remain covered by the leaves. The same must be done in the pots, and thus the plants will be secured from the winds.

After this let all the plants be watered every other day towards evening, and they will flower in full perfection. Those in the pots will be the smallest plants, but they will often produce the finest flowers.

Æthiopian MARIGOLD. This is an elegant and singular perennial plant. It has every advantage which profusion of flowers, lasting beauty, and an easy culture can give, to recommend it to our attention. The root is brown and fibrous: it spreads under the surface of the ground, and lasts many years. The leaves rise from it in regular thick tufts: they are four inches long, and moderately broad, smallest at the base, larger to the end, deeply sinuated, and sharp-pointed as a spear. They are of a fleshy substance, and of a fine green colour; among these rise the stalks: they are numerous, upright, naked, and of a bright pale green: each sustains a single flower, which is very large and beautiful. It consists of a central disk, and radiated edge: and in each part there is great elegance and variety. The rays or long petals of the edge are of a perfect white within, and of a bloody purple on the outside.

Culture of the Æthiopian MARIGOLD.

This plant must be first raised from seeds, and then may be propagated by parting of the roots. Sow the seeds upon a hot-bed in the spring, with those of the *Marvel of Peru*; treat the plants in the same manner: and when those are planted out, let these be also set in large pots, filled with the following compost: mix equal parts of pond-mud, coarse-sand, and earth from under a wood-pile.

In the centre of each pot place one of the plants, and settle the earth well to their roots. When they have got strength from the setting, place them in the open air among the green-house plants, where they may remain till October, when they must be removed into the stove, and there preserved the winter. There usually break out some very fine flowers upon them the first year, but the May following buds will appear in great numbers, and they must then be watered frequently. As the flowers fade let their stalks be cut off, and they will thus be loaded with a fresh succession most part of the season.

Corn MARIGOLD. See the article **CHRYSANTHEMUM**.

Fig MARIGOLD, *Mesembryanthemum*, a genus of plants, ranged by Linnæus among the *icosandria pentagynia*. Botanists distinguish a vast many species of this plant, but the above-named writer has reduced them to the thirty-five following. 1. Fig Marigold, with taper,

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obtuse, hairy leaves, placed alternately, called the Egyptian Hali. 2. Fig Marigold, with oval, obtuse, waved leaves, placed alternately, commonly called the Diamond Ficoides, Diamond Plant, or Ice Plant. 3. Fig Marigold, with half taper leaves, and flowers sitting close to the wings of the stalks. 4. Fig Marigold, with half cylindrical leaves, and quadrifid flowers. 5. Fig Marigold, with awl-shaped, three-cornered leaves, an erect stalk, and a corymbus of flowers at the triple division of the stalk. 6. Fig Marigold, without a stalk, with half taper leaves, which join at the base, and flowers with eight styles. 7. Fig Marigold, with plain, spear-shaped, circulate leaves. 8. Fig Marigold, without a stalk, with narrow, three-cornered leaves, marked with three indentures at their points. 9. Fig Marigold, having stalks, and three-cornered, indented leaves, which are shaped like the Greek Delta. 10. Fig Marigold, with the points of the leaves bearded. 11. Fig Marigold, with a prickly stalk, and deflexed, cylindrical leaves. 12. Fig Marigold, with the stalks and leaves decorated with downy hair. 13. Fig Marigold, with awl-shaped leaves, which are every where rough on their under-side. 14. Fig Marigold, with the joints of the stalks terminated by acute-pointed leaves, which are indented on their under-side, commonly called Buckhorn Ficoides. 15. Fig Marigold, with branching spines. 16. Fig Marigold, with awl-shaped, prickly leaves, and a bearded root. 17. Fig Marigold, with awl-shaped, half taper, smooth leaves, which are longer between the joints. 18. Fig Marigold, with awl-shaped, cylindrical leaves, having distinct, dark-coloured pimples. 19. Fig Marigold, with a creeping stalk, which is half cylindrical, and with half cylindrical smooth leaves, joining at their base, and their points three-cornered. 20. Fig Marigold, with distinct, smooth falcion-shaped leaves, and taper branches. 21. Fig Marigold, with falcion-shaped leaves, connected at their base, with the keel-shaped angle rough, and with angulated branches. 22. Fig Marigold, with rough, three-cornered leaves, and petals to the flowers, which are of two colours. 23. Fig Marigold, with awl-shaped, three-cornered leaves, and with the keel-shaped angle sawed on the out-side. 24. Fig Marigold, with awl-shaped, cylindrical leaves, which are pimply and distinct, and a rough stalk. 25. Fig Marigold, with linear, obsolete, three-cornered leaves, which are distinct and smooth, and imbricated at the top. 26. Fig Marigold, without a stalk, with half cylindrical leaves, which have tubercles on their outsides, and are joined together. 27. Fig Marigold, with cut, cylindrical leaves, connected together at their base, bowed and smooth. 28. Fig Marigold, with awl-shaped, three-cornered leaves, marked with obsolete, pellucid punctures. 29. Stalky Fig Marigold, with awl-shaped, semi-cylindrical, recurved, long leaves, which are connected at their base. 30. Fig Marigold, with plain, oval, acuminate, entire leaves, which are placed opposite, and connected together at their base. 31. Fig Marigold, with a short stalk, and leaves having hairy indentures, commonly called Dogs Chap Ficoides. 32. Fig Marigold, with ax-shaped leaves. 33. Fig Marigold, with disarmed leaves. 34. Fig Marigold, without a stalk, with tongue-shaped leaves, the borders of which are thicker on one side. 35. Fig Marigold, with alternate, awl-shaped, three-cornered, very long leaves.

These species are all of them natives of Africa, and have beautiful flowers, which appear at different seasons of the year, some of them flowering early in the spring, others in summer, some in the autumn, and some even in winter.

Culture of the Fig MARIGOLD.

The first and second species are annual plants, and all the rest perennial.

For the description and culture of the second species, see the article **ICE-PLANT**.

All the other species are propagated by cuttings, during any of the summer months, which should be planted in a bed of light soil, covered with mats or glasses; a little water should be given them to settle the ground

ground about them, and they must be shaded in the heat of the day for some time, to prevent the ground from drying too fast. In about six weeks the cuttings will have taken root, then they should be carefully taken up, and each planted in a separate pot filled with light sandy earth, and placed in a shady situation, giving them a little water as before. In this place they may stand ten days or a fortnight, till they have taken good root: after which they may be removed to a sheltered place, where they will have more sun, and where they may remain till autumn, and in winter let them be sheltered under a common frame, where, if they are protected from frost and wet, it is all the care they will require.

French or African MARIGOLD. See the article *African* MARIGOLD.

Marsh MARIGOLD, *Caltha*, a genus of plants, ranged by Linnæus among the *polyandria polygamia*, and of which there is only one species.

This plant grows upon moist, boggy lands, in moist parts of England; but there is a variety of it which is cultivated in gardens, and the extreme beauty of its double flowers renders it worthy a place in every collection.

Culture of the Marsh MARIGOLD.

It is propagated by parting of the roots in autumn. They should be planted in a moist soil and a shady situation, and when the plants come up they will only require the common care of being kept clean from weeds, and sometimes watered.

MARJORAM, a species of *Origany*. See the article *ORIGANY*.

MARTAGON, a species of *Lily*. There are many beautiful varieties of this plant, of which the three following are extremely elegant. 1. Imperial Martagon. 2. Two-staged Martagon. 3. Late Poinponian Martagon.

Imperial MARTAGON. The root of this plant is roundish, small, yellow, and formed of numerous pointed scales. The stalk is upright, firm, round, of a purplish colour, and two feet and a half high: towards the top it is a little hairy, and sometimes all the way. The leaves are short, broad, and of a deep green: small at the base, and veined with conspicuous ribs on the under-side: they grow in regular clusters, at certain distances, surrounding the stalk. Toward the top there stand a few loose scattered leaves, which are longer and narrower than the others. The flowers are very beautiful, they crown the stalk in great numbers, and rise one above another in a kind of pyramidal form. They are large, and of a pale red, spotted with a deeper red or purple, in a various and irregular manner, but very pleasing. Each flower has its separate foot-stalk, and hangs down, but every petal turns up again. The whole head of these is very numerous, and their smell a delicate and rosy sweet.

Culture of this MARTAGON.

It is propagated either from seeds or by parting of the roots: the latter is the most common method, but the former is the best: either way the following compost must be prepared for them.

A bushel of pond-mud, two bushels of rich pasture-mould, half a bushel of wood-pile earth, and a peck of sand; these should be mixed in spring, and turned two or three times between that season and July, when it will be proper to plant the off-sets from the roots.

These are to be taken off when the stalks are decayed, and they must be planted immediately. A part of the garden should be chosen where there is the morning sun and some shade: here the compost must be put in the place of the common mould; let the off-sets be planted at two feet distance, and afterwards kept clear from weeds and occasionally watered.

This is the common method of culture: but the plants raised from seeds will be far preferable, the flowers will be larger, and more elegantly spotted, and the varieties almost numberless.

The seeds should be saved from a strong and healthy plant, and sown on a bed of the same compost, in a part of the seminary open to the morning sun for two

hours, but sheltered from its rays during the rest of the day. The best time for this is the middle of August: they must be scattered thick upon the mould, and covered a finger's breadth with the same compost sifted over them. From this time the bed must be kept clean from weeds, and sometimes slightly watered. In the succeeding spring they will shoot, and the young plants, when they have a little growth, must be thinned where they have risen too close; and when the leaves are decayed, cover the roots with half an inch of fresh mould.

The succeeding August the mould must be sifted, the roots taken carefully out, and planted in the garden, in a new bed of the same compost, a little more exposed to the sun, but still shaded from the full blaze of noon. They should be planted at a foot distance, and managed as before, weeding and watering till they flower.

There will be found a great many varieties, and the best should be marked while in flower; these must be preserved separate afterwards, and the rest planted out into common borders. The varieties consist in three particulars. First, in the ground colour of the flower, which will be fleshy, crimson, or pale purple; secondly, in the tinct of the spots, which will be of a deep orange, blood colour, or a violet purple, or almost black; thirdly, in their distribution and form, some will be round, others oblong, and they will throw themselves into various wild arrangements.

When the finest flowers have been separated from the rest, their roots must be taken up as soon as the stalk is decayed, and planted again immediately in a fresh compost of the same kind, at two feet distance. This must be done every year: the off-sets must be always carefully taken off, and the old compost cleared away.

The third year of their flowering let seeds be saved from one of the finest plants, and these sown, and the plants managed just as directed for the first.

Two-staged MARTAGON. The root of this is larger than in the other kind, proportioned to the plant: it is composed of numerous scales, and has several thick fibres. The stalk is round, firm, perfectly upright, and more than a yard high. Its colour is naturally a dusky green, and it is stained in various degrees with purple. The leaves are broad, short, and of a deep green, with high veins on the under part. There are usually four or five circles of them round the stalk, at different distances: and toward the top two or three loose, irregular, and smaller leaves, narrower, and of another form. The flowers are extremely numerous and elegant, and they are disposed in a pyramidal, but interrupted spike. At some considerable distance above the uppermost leaves, there rises a cluster of them on long foot-stalks: these surround the stalk, and form a kind of circular crown; above these it is for some space naked, and then begins another species of flowers, forming a compleat spike to the top. The ground colour of the flower is a pale fleshy crimson: the spots are frequent, and of a perfect blood-colour. The scent is musky, sweet, and very strong.

Culture of this MARTAGON.

It is an accidental variety produced from the seeds of the common sort, and nothing is more precarious than its propagation. When such a flower is once obtained more than ordinary care must be taken of it, and of its off-sets. No change must be made in the soil, but it must be allowed a sufficient quantity: nothing should stand within three feet of it, the stalk should be firmly secured by a stake and frequent tying, and the space of ground devoted to its nourishment must be often stirred and oftener watered. In this manner the plant is to be brought to flower, and in order to save seed from it, the upper spike of flowers should be cut off before they blow, and only the crown or lower circle left to perfect their seed. This will be strong and vigorous in the highest degree, and in all probability, when sown again, will re-produce the two-staged kind.

Late Poinponian MARTAGON. The root of this species is very singular: it is not composed of thick scales as in the others, but coated as an onion. The stalk

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stalk is simple, firm, upright, two feet and a half high, round, striated, and of a pale green, tinged with brown or yellow. The leaves are very numerous, and stand irregularly; they are of a moderate length, narrow, and in some degree triangular, sharp-pointed, and of a strong and lively green. The flowers are very numerous and beautiful, they crown the stalk, and rise also from the bosoms of the upper leaves. They have long foot-stalks, from which they hang drooping. Their colour is a high and perfect scarlet, spotted with black.

Culture of this MARTAGON.

The seeds of the early, or common Pomponian Martagon raise this. A warm spot of ground should be chosen for it, and the roots must be planted deep to defend them from the severity of the frost; they must not have a moist or too rich soil.

The best compost for them is rich pasture-earth, with a little wood-pile mould and rotted cow-dung; this should be mixed up in spring, and it will be ready to receive the seeds in autumn.

These must be sowed from strong healthy plants, and in autumn a bed must be made up in the seminary with the above compost, chusing a spot that is open to the south-east, and defended from all the cold quarters. The surface of the bed must be raked level, and the seeds scattered over it with an even hand: they should be sown thick, for many fail. When the plants come up they must be thinned and weeded; and in autumn, when the leaves decay, half an inch of the same mould must be sifted over the whole bed. In this manner they must be kept one year more, and it will then be time to remove them.

A bed must be made up with the same compost in some sheltered part of the garden, and the roots taken up soon after the leaves have faded, and planted in this bed at ten inches distance, covering them two inches with the compost; here they are to stand till they flower, when there will be found a great variety: some will be of a dark, some of a pale tinct, some a perfect red, and others yellowish.

The finest must be marked, and the rest, when the leaves are decayed, must be taken up, and planted in other places. By this method the fine flowers which are left will have good room, and they must at the approach of winter be covered with another inch of the same mould. Their proper place in the earth is about five inches under the surface, they never fail to shoot strong through this, and the burying them thus is their best defence during the winter.

The next year they will shew their flowers in perfection, and from this time they are to be treated as others of the same kind. They should be taken up every year as soon as the stalks and leaves are decayed, and planted again in a fresh bed of the same soil: they must be sheltered from the north winds, and open to the morning sun, but defended from that of noon-day: and they will thus produce abundance of flowers, extremely elegant, and very lasting.

MARSH-MALLOWS. See the article *Marsh-Mallows*.

MARSH-MARIGOLD. See *Marsh-Marigold*.

MARTYNIA, a genus of plants, which has no English name, and only three species. 1. Martynia, with a branching stalk and angular leaves. 2. Martynia, with a single stalk and sawed leaves. 3. Martynia, with a branching stalk and oval, heart-shaped, hairy leaves.

The first species rises with a strong herbaceous stalk near three feet high. The leaves are oblong, oval, hairy, and cut into angles on their sides. The flowers grow in short spikes at the ends of the branches: they are of a pale purple colour, and succeeded by oblong, oval capsules; when these are ripe they divide into two parts and drop off, leaving a large hard nut hanging on the plant: within are four oblong cells, two of which have a single oblong seed in each, but the other two are abortive. If the plants are brought forward in the spring, they will begin to shew their flowers in July,

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and there will be a succession of them on the same plant till the end of September, when the plants decay.

The second species is a native of Carthage in New Spain. It has a perennial root and an annual stalk. The roots are thick, fleshy, and divided into scaly knots: from this rise several single, fleshy, succulent stalks, about a foot high, of a purplish colour. The leaves are thick, oblong, sawed on their edges, rough on their upper side, where they are of a dark colour, but their under side is purplish. A spike of blue flowers crowns the top of the stalk. They are not succeeded by seeds in England.

The third species grows naturally in the Mississippi. It rises with a thick fleshy stalk about two feet high, which divides into three, and sometimes four spreading branches. The leaves are oval, heart-shaped, very viscous, hairy, and of a soft green. The flowers terminate the branches in a loose thyrse: their colour is a very pale purple; they are succeeded by large oval fruit, shelled like a walnut: when the fruit is ripe this shell drops off, and leaves a hard fibrous nut hanging on the plant, which opens in the middle, having four cells, each containing three or four oval seeds.

Culture of the MARTYNIA.

The first and third species being annual plants are only propagated by seeds, which should be sown in pots and plunged into a hot-bed of tanners-bark, where, if the seeds are intirely separated from their covers, the plants will appear in about a month, and will grow tolerably fast if the bed is warm. In a little time after they appear they should be transplanted each into a separate pot, and plunged into the bark-bed again, where they must be watered and shaded till they have taken fresh root, after which they should have a large share of free air admitted to them.

In about a month they will have filled the pots with their roots, when they should be removed into pots about a foot diameter at the top, and plunged into the hot-bed in the bark-stove, where they should be allowed room, for they put out many side-branches, and will grow three feet high or more, according to the warmth of the bed and the care which is taken to supply them constantly with water.

When these plants thrive well the side-branches will all produce small spikes of flowers, but it is only from the first spike that good seeds can be obtained, so that great care should be taken not to pull off or destroy any of the flowers.

The second species is propagated by parting of the roots, the proper time for this is about the middle of March: they must be planted in pots of a middling size and plunged into the bark-bed, where they must always remain. The plants die to the root every winter, at which season they must have very little water, and in every respect treated like other tender exotics which require the bark-stove.

MARVEL-OF-PERU, or FOUR-O'CLOCK-FLOWER, *Mirabilis*, a genus of plants, ranged by Linnæus among the *pentandria monogynia*: he distinguishes only one species of it, of which the Jalap of the shops is a variety.

This plant is a native of both Indies. It rises a yard high, and spreads into numerous branches. The root is long and thick, and has many fibres. The stalk is jointed, and the leaves are placed in pairs: they are oblong, broad, and not divided at the edges. Their colour is a fine deep green. The flowers are extremely beautiful: some terminate the stalks, and others rise from the bosoms of the leaves and branches: they are broad, expanded, and of various dyes, not only on different plants, but often on the same. The natural colour is a tawny yellow, but from this they vary into the deepest purple, and the faintest flesh-colour: sometimes they are of a pure snow-white, and at others variegated in a most elegant manner with purple and white, flesh-colour and white, or all these colours, and the original yellow.

Culture of the MARVEL-OF-PERU.

It is propagated by seeds, which should be sown in the spring upon a moderate hot-bed. When the plants

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come up they must have plenty of free air admitted to them if the weather is mild: and when they are two inches high, they should be transplanted on another moderate hot-bed, or planted each in a small pot filled with light earth, and plunged into a moderate hot-bed, where they must be shaded till they have taken new root, after which they must be gradually inured to the open air, and in June transplanted into the borders of the pleasure-garden.

During the time of flowering the plants should have a little water twice a day.

MASTERWORT, *Imperatoria*, a genus of plants, ranged by Linnaeus among the *pentandria digynia*, and of which there is only one species.

This is a perennial plant which grows naturally upon the mountains of Austria and Switzerland. The root is about the thickness of a man's thumb; the leaves rise from the root: they have long foot-stalks, dividing into three very short ones at the top, each sustaining a trifoliate leaf, indented on the border. The flower-stalks rise about two feet high: they divide into two or three branches, and each is terminated by a large umbel of white flowers.

Culture of the MASTERWORT.

It is propagated either by seeds or by parting of the roots. If by seeds they should be sown in autumn soon after they are ripe, on a bed or border in a shady situation.

In the spring, when the plants appear, they should be carefully weeded: and if the season should prove very dry, let them be now and then refreshed with water, which will greatly promote their growth.

About the beginning of May, if you find the plants come up close together, prepare a moist shady border, and thin the plants so as to leave them at the distance of six inches asunder: plant those which you draw up into the border, about the same distance apart, being careful, if the season should prove dry, to water them duly till they have taken new root: after which time these plants, as also those remaining on the seed-beds, will require no other culture but to be kept free from weeds, which may be easily effected, by hoeing the ground between the plants now and then in dry weather.

The following autumn they should be transplanted to the places where they are designed to remain, which should be in a rich moist soil, at the distance of two feet asunder. When they have taken root they will require no other care than to be kept clean from weeds. In the spring, before they shoot, the ground should be every year gently dug between the plants, in doing which great care should be taken not to injure their roots.

If you would propagate this plant by off-sets, the roots should be parted at Michaelmas, and planted in a shady situation, at the distance already directed for the seedling plants, and they require the same management.

MASTICK, a species of Tree Germander. See the article *TREE GERMANDER*.

MASTICK-THYME, a species of Savory. See the article *SAVORY*.

MASTICK-TREE, a species of Pistacia. See the article *PISTACIA*.

Indian MASTICK, *Schinus*, a genus of plants, of which there are two species. 1. Indian Mastick, with winged leaves, whose lobes are sawed. 2. Indian Mastick, with winged leaves, and jointed bordered foot-stalks, having thorns on the under side.

The first species is a native of Peru and Mexico. It rises with a woody stalk eleven or twelve feet high, dividing into many branches. The leaves are composed of several pair of lobes, terminated by one which is longer than the rest: they are of a lucid green. The flowers grow at the ends of the branches in loose bunches; they are very small, and their colour is a perfect white.

The second species is a native of the West Indies. It rises with a ligneous stalk ten feet high, sending out many branches. The leaves are winged, the mid-rib of them is bordered and jointed, and armed with crooked spines under each joint.

Culture of the Indian MASTICK.

The first species is propagated by seeds, which should

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be sown in pots, and plunged into a moderate hot-bed. If the seeds are good the plants will appear in about five or six weeks: and if they are properly managed, by admitting fresh air to them, according to the warmth of the season, they will be fit to remove in six weeks after, when they should be each planted in a small pot, and plunged again into a moderate hot-bed, shading them from the sun till they have taken fresh root, when they must be gradually inured to the open air, into which they should be removed soon after, placing them in a warm situation, where they may remain till autumn, but they must be removed into shelter before the first frosts, otherwise their tops will be killed, which generally destroys the plants.

This species may also be propagated by layers and cuttings: the layers should be put down in the spring, and by the following spring they will be rooted. The cuttings should be planted in April, which will put out roots in about two months, and may afterwards be treated as the seedling plants.

The second species is propagated by seeds, which should be sown in small pots, and plunged into a hot-bed of tanners-bark: these seeds will often lie three or four months in the ground, and sometimes a whole year; therefore if the plants should not come up the same year, the earth should not be disturbed in the pots, but in the winter placed in the bark-bed in the stove, and the spring following plunged again into a fresh hot-bed, which will bring up the plants if the seeds are good. When the plants are fit to remove, they should be each planted in a separate small pot, and plunged into the tan-bed, where they must be shaded till they have taken new root, after which they must be treated as other tender stove-plants.

MAUDLIN, a species of Achillea. See the article *ACHILLEA*.

MAY, the fifth month of the year.

In the *Flower-garden*. Take care of the auriculas now in bloom, as also of the hyacinths, ranunculus's, anemones, and tulips; the wind, rain, and sun must be kept off by moderate coverings. The amaryllis's, and other autumnal flowers, must now have their roots taken out of the ground: let this be done with care, and dry them gently upon mats in an airy place, out of the reach of the sun, then tie them up in parcels till the time of planting them towards the end of summer. Harden the tender annuals to the air, and now plant the strongest and most forward of them. Sow hardy annuals on the borders, and give them free and frequent waterings. Observe the leaves of the hyacinths which are past flowering, they will begin to decay, and the roots should be taken out of the ground. Shade the beds of fine flowers at noon, and let them occasionally have water. Keep the borders, grass, and gravel-walks in order: the gravel should be rolled often and cleared from weeds, the borders should not only be weeded but stirred and raked once in three or four days. Take up the roots of fine colchicums, and clean them and spread them out on a mat in a dry airy room: when they are a little hardened put them up till the time of planting, which should be about nine weeks after; different roots require various management in this respect: there is in many of the bulbous roots a time of rest between the decay of the leaves and shooting of the next bloom. The tuberous rooted flowers of autumn will about the middle of this month be in a state to be removed: these are to be taken up and planted afresh as soon as out of the ground. See in what place the climbing plants will be proper, and sow them. Carnations towards the end of this month will shew the buds for their flowering: let the plants be examined carefully, all decayed leaves taken off, and the stalks tied to sticks. The tenderest annuals raised in hot-beds may now have their last removal. Plant some good roots of tuberose in a hot-bed that has a moderate warmth, and they will flower about October. As the leaves of the bulbous and tuberous-rooted spring-flowers decay take up the roots, clear them from mould, spread them upon a mat in a shady place, and then put them up for the next plantation. Keep the boxes of seedling flowers

flowers where they have only the morning sun. The carnations will, about the end of this month, grow more forward towards flowering: the earth must be kept moistened, and insects picked off, if at any time found upon the plant. Auriculas, as they are past flowering, must be removed from the stands, and placed on some part of the ground where they can have only the morning sun: after this no moss or weeds must be suffered to grow upon the mould, and thus they are to be left for summer. Look over the borders and see where any thing can be added for the autumn flowering: clean and lay in order every part of the ground. The flower-beds must be kept clean from weeds, and none should be suffered to remain any where about the garden. Mow grass-walks frequently, and let the gravel be kept rolled and cleaned.

In the *Seminary*. Plant out in the open ground such seedlings of exotic trees and shrubs as are to stand the weather, but requiring some care, and while young, are first raised in pots. Dig up a piece of ground in a warm and sheltered part of the nursery, for sowing some of the American trees, particularly the coniferous kinds. In this month weeds rise up abundantly, and must be every where destroyed. Clear the beds of seedling plants and trees by hand, and when the earth is broken by pulling up the roots, give a gentle watering. Next clear the rows of new-planted trees. Examine the beds sown in the spring, and on which there is yet no appearance of any shoot; they will require defence and watering. Transplanting may be continued in the open air for certain kinds and on particular occasions, during this month. In the nursery of flowering plants for the next year, this is now to be managed with due care. Look over grafted trees, and give them liberty at the bandage; let the loam be cleared away, and the bafs untied, and with a flannel wetted in water just made milk-warm, let the part be washed clean. Seedling trees which have been raised in separate beds in the seminary, will require frequent waterings towards the end of this month; weed them also carefully from time to time, and give the waterings an hour before sun-set. Let the gardener now take the advantage of a showery day for the laying some branches of those shrubs and trees which will not readily take root, except by the shoots of the same years growth: this is the case with several of the ever-greens, and with the generality of the woody, climbing plants. Water the biennial and perennial flower-roots raised from seed last season, and now transplanted into separate beds, and keep the ground clear from weeds between them. Look over the trees that were budded last season, see that the roots be not defrauded of nourishment, nor left in the way of mischief from insects; suffer no shoots from the stock, these must be rubbed as soon as they appear. The beds of seedling plants and shrubs must be watered at times, and shaded from the full noon-day sun: the mould must be kept perfectly free from weeds between them, and now and then broke with a trowel. No part of the gardener's ground requires moisture so much as the nursery: let him from time to time examine the condition of the mould about the new planted as well as seedling trees and shrubs, and where he finds nature has not given moisture enough, supply it with water.

In the *Fruit-garden*. Take care of the forcing frames, they must be frequently stirred up about the roots, and they must have every day a moderate watering. The trees must be opened to the air, and every other day it will be very serviceable to water them all over branches, leaves, and fruit. Look over fruit-trees against walls, if any branches are loose fasten them carefully: rub off all the fore-right and irregular shoots, and train to proper places those that are fit for service: then go over the espaliers in the same manner. Look to all new-planted trees, see they be firm in their places, and promote their growth by watering. As wall-fruits are coming forward towards the end of this month, they should be well thinned; observe which are the most promising, and the taking off a part of the worst gives more nourishment to the others: this thinning must be done with caution, for there are many accidents to which the remainder

will be liable: snails devour many, they must be watched daily at the times of their coming out of their holes and destroyed; let the ground about the trees have such a dressing as will make them a fresh supply of nourishment.

In the *Kitchen-garden*. Begin the month with a general weeding among the smallest kind by hand, for others the hoe is to be used. In those in rows, at a due distance, use the spade: follow the weeding by a general watering; hoe in the dryest days, weed by hand after a little rain. Dig in either weather. Slip some artichokes, and chuse a moist part of the ground for planting them. Sow young fallading on a shady part of the ground open to the north-west. Slip sage and other aromatic kinds, and plant them out on a shady border. Sow some good seed of cos and celicia lettuces. In a fair evening after a shower, draw up some mould about the stems of the cabbages and cauliflower-plants. The celery-plants may be transplanted about the beginning of this month. Look after the insects, which if not destroyed before they copulate, will lay the foundation for an unconquerable multitude. Beans and pease, which will now be in flower upon warm borders, will require good watering. Plant pease, beans, and French-beans. Plant out radishes for seeds. Let the gardener go over the plantation of early cabbages, and tie them up with soft bafs. Beans, pease, and French-beans may be planted till near the end of this month, but they will require more watering than those planted earlier: they must also be duly weeded, and the mould between them must be frequently broke. Weeding and watering now become necessary to the whole ground, and must be continued from time to time with due care: the young crops will require most of the former, and the old of the latter. Sow young fallad herbs; once a week plant out the cabbages and favoys for winter use: this must be done upon part of the ground cleared from other crops. The cucumber and melon plants must now be carefully attended; they are apt to hang their leaves and grow faint: this happens either from the too great power of the sun, or the want of a sufficient depth of mould; in the first case the frame must be covered with mats in the heat of the day instead of glasses, and in the other an inch depth of fresh mould must be spread over the whole bed.

In the *Green-house*. About the end of this month bring into the open air those natives of warmer climates which have been sheltered from winter, and admit more air to those which will not at any time endure the free exposure. The green-house plants are to be removed into proper parts of the garden: but before they are removed they should be cleaned in every part, freed from decayed leaves, and refreshed by some new mould, after stirring the surface of that in which they grow: these being now taken out, the others will have room to be brought to the windows in order to have as much air as possible, with any degree of defence.

The *Stove*, towards the end of this month should be refreshed with airings; at evening the glasses must be closed to keep out the cold that will attend even our warmest seasons, and in the middle of very hot days they must be shaded. Many of the most elegant plants in this department will now require transplanting: those raised from seed have been planted in little pots and set in the bed; these, as they increase in bigness, will require more earth for their roots. Let the plants in general be carefully looked over and well cleaned; let the mould on the surface in all the pots be broke, and refreshed by a small addition of a compost of the like kind, and let the several plants, according to their nature, have now and then a gentle watering from some fine-nosed pot.

MAYWEED, *Cotula*, a genus of plants, ranged by Linnæus among the *syngnesia polygamia superflua*, and of which there are four species. 1. Mayweed, with many-pointed winged leaves, and no rays to the flowers. 2. Mayweed, with spear-shaped, narrow, many-pointed leaves embracing the stalks. 3. Mayweed, with lyre-shaped winged leaves, and radiated flowers. 4. Mayweed, with receptacles swollen, and turbinate beneath.

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These are all annual plants. The first species grows naturally in Spain and the island of Helena. The second and fourth species are natives of Africa, and the third of Vera Cruz.

Culture of the MAYWEED.

The first species is propagated by seeds, which if the plants are permitted to scatter, a new succession will come up in the spring, and will require no other care than keeping them clean from weeds, and thinning them where they grow too close.

The second, third, and fourth species are raised from seeds, which should be sown on a moderate hot-bed in the spring: and when the plants are fit to be removed, they may be transplanted to a warm border, where they will require no other care but to keep them clean from weeds.

MAYWEED, a species of Chamomile. See the article CHAMOMILE.

MEADIA, a genus of plants, of which there is only one species.

This plant grows naturally in Virginia and other parts of North America. It has a perennial root, from which come out several smooth leaves, which are six inches long, and two and a half broad, at first standing erect, but afterwards they spread on the ground, especially if the plants are much exposed to the sun; from between these leaves arise three or four stalks, in proportion to the strength of the roots, eight or nine inches high: they are smooth, naked, and are terminated by an umbel of flowers, under which is situated as many-leaved involucre; each flower is sustained by a long slender foot-stalk, which is recurved so that the flower hangs downward: it has but one petal, which is deeply cut into five spear-shaped segments, which are reflexed backward; the stamina, which are five in number, are short, and sit in the tube of the flower, having five arrow-pointed summits, which are connected together round the style, forming a sort of beak. The flowers are purple inclining to a peach-blossom colour, and have an oblong germen situated in the bottom of the tube, which afterward becomes an oval capsule inclosed by the empalement, with the permanent style on its apex, which when ripe opens at the top to let out the seeds, which are fastened round the style. This plant flowers the beginning of May, and the seeds ripen in July, soon after which the stalks and leaves decay, so that the roots remain inactive till the following spring.

Culture of the MEADIA.

It is propagated by off-sets, which the roots put out freely when they are in a loose moist soil and a shady situation; the best time to remove the roots and take away the off-sets is in August, after the leaves and stalks are decayed, that they may be fixed well in their new situation before the frost comes on. It may also be propagated by seeds, which the plants generally produce in plenty: these should be sown in the autumn soon after they are ripe, either in a shady moist border, or in pots which should be placed in the shade; in the spring the plants will come up, and must then be kept clean from weeds, and if the season proves dry they must be frequently refreshed with water: nor should they be exposed to the sun, for while the plants are young they are very impatient of heat; these young plants should not be transplanted till the leaves are decayed, then they must be carefully taken up and planted in a shady border, where the soil is loose and moist, at about eight inches distance from each other, which will be room enough for them to grow one year, by which time they will be strong enough to produce flowers, so may then be transplanted into some shady border in the flower-garden, where they will appear very ornamental during the continuance of their flowers.

MEADOW SWEET, a species of Spiræa. See the article SPIRÆA.

MEDEOLA, a genus of plants which has no English name; there are four species of it. 1. Medeola, with oval, spear-shaped, alternate leaves, and a climbing stalk, commonly called climbing African Asparagus, with a myrtle leaf. 2. Medeola, with spear-shaped,

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alternate leaves, and a climbing stalk; or narrow-leaved, climbing African Asparagus. 3. Medeola, with leaves growing in whorls, and prickly branches. 4. Medeola, with leaves growing in whorls, and smooth branches.

The first and second species grow naturally at the Cape of Good Hope; they have tuberose roots, composed of several dug or oblong knobs, which unite together at the top, from which arise two or three stiff stalks, which rise four or five feet high if they have any support to which they can fasten, otherwise they fall to the ground. The leaves of the first are oval, spear-shaped, ending in acute points, and placed alternate: their colour is a light green on the under side, and dark on the upper. The leaves of the second are much longer and narrower, in which their difference consists. The flowers come out from the sides of the stalks, sometimes singly, at others there are two upon a slender short foot-stalk: they have six oblong equal petals, of a dull white colour: within these sit six stamina, which are as long as the petals, terminated by incumbent summits; in the center is situated a germen with three horns, sitting upon a short style, and crowned by three thick recurved stigmas: the germen afterward turns to a roundish berry with three cells, each containing one heart-shaped seed.

The third sort grows naturally in the West-Indies. This is a very low shrub, seldom rising more than three feet high in its native soil. The stalks are herbaceous, and divide upwards into several branches. The leaves are stiff, ending in acute spines: these stand in whorls round the stalks, there are eleven or more at each joint. The flowers are produced just under the leaves, sometimes singly, at others there are two which come out from the same joint: they are of an herbaceous white colour, having six oblong pointed petals, with six stamina not so long as the petals, and a roundish germen, which afterwards turns to an oval berry with three cells, each having one heart-shaped seed.

The fourth species is a native of North America. This hath a small scaly root, from which arises a single stalk about eight inches high. The leaves grow at a small distance from the ground in whorls, and at the top there are two leaves standing opposite: between these come out three slender foot-stalks, which turn downward, each sustaining one small, pale, herbaceous flower, with a purple pointal.

Culture of the MEDEOLA.

Both the first species propagate freely by off-sets from the roots, so that when they are once obtained, there will be no necessity of sowing their seeds, which commonly lie a year in the ground; nor will the plants be strong enough to flower in less than two years more, whereas the off-sets will flower the following spring. The time for transplanting and parting of the roots is in July, when their stalks are entirely decayed, for they begin to shoot towards the end of August, and keep growing all the winter. These roots should be planted in pots, and may remain in the open air till there is danger of frosts, when they must be removed into shelter, for they are too tender to live through the winter in the open air: but if they are placed in a warm green-house, they will thrive and flower very well, but they seldom produce fruit unless they have some heat in winter; therefore where that is desired, the plants should be placed in a stove and kept to a moderate degree of warmth.

The third species is a tender plant, and will not thrive in this country unless it is placed in a bark-stove; it is propagated by seeds, which should be sown in pots, and plunged into a bark-bed, where they may remain all the summer, for the plants seldom come up the first year. In autumn they should be removed into a fresh hot-bed, which will bring up the plants: but as these are very slow in their growth, they will not be fit to transplant till the following spring, when they may be each planted in a separate pot filled with light sandy earth, and plunged into a fresh hot-bed, shading them from the sun till they are new rooted: after which they must be treated

treated in the same way as other tender plants from the same country.

The fourth species is hardy enough to live in the open air, but does not propagate fast here, as it produces no seeds, so can only be increased by off-sets.

MEDLAR, *Mespilus*, a genus of plants, ranged by Linnæus among the *icosandra pentagynia*, of which there are twenty-two species. 1. Great Medlar, with a bay-tree leaf. 2. Medlar, with a bay-tree leaf, which is not sawed. 3. Medlar, with a cut, smallage leaf, commonly called L'Azarole. 4. Wild Medlar, with a smallage leaf and prickly branches; or common Hawthorn. 5. Medlar, with a cut, smallage leaf, and a yellowish white fruit. 6. Prickly Medlar, with spear-shaped, oval, crenated leaves, called *Pyracantha*. 7. Large prickly Medlar of Virginia, called Cockspur Hawthorn. 8. Medlar without thorns, and oval, sawed, smooth leaves, commonly called Cockspur Haw without thorns. 9. Medlar, with spear-shaped, oval, crenated, smooth leaves, and prickly branches, called Virginia L'Azarole. 10. Medlar, with spear-shaped, sawed leaves, very strong spines, and flowers growing in round bunches. 11. Medlar, with heart-shaped, oval, acute-pointed leaves, which are sharply sawed, and prickly branches. 12. Medlar, with oblong, oval, acute-pointed, smooth leaves, which are angularly sawed, and prickly branches, called Maple-leaved Hawthorn. 13. Medlar, with oval, smooth leaves, which are angularly sawed, and smooth branches. 14. Medlar without thorns, and oval, spear-shaped, veined, sawed leaves, which are hairy on their under-side. 15. Medlar, with oval, obtuse, smooth leaves, which are sawed toward their points, and an oval fruit, commonly called Pear-shaped Haw. 16. Medlar, without spines, and obverse, oval leaves, which are slightly indented toward their ends, and green on both sides. 17. Medlar, with spear-shaped, oval leaves, which are sawed, and hairy on their under-side, flowers growing singly with leafy empalements, and very long spines, commonly called Lord Islay's Haw. 18. Medlar without thorns, having oval, sawed leaves, and hairy stalks, commonly called Amelanchier. 19. Medlar, with oval, oblong, smooth, sawed leaves, and branches without thorns. 20. Medlar, with oval, intire leaves, commonly called Dwarf Quince. 21. Medlar without thorns, having smooth, oval, sawed leaves, headed flowers, and linear bractæe which fall off. 22. Medlar, with oval, thick, intire leaves, which are woolly on their under-side, and flowers growing in umbels from the wings of the stalks; or Dwarf Cherry of mount Ida.

The first species grows naturally in Sicily, where it becomes a large tree. It rises with a straiter stem, and the branches grow more upright than those of the Dutch Medlar. The leaves are narrower, and not sawed on their edges. The flowers are smaller, and the fruit is shaped like a pear.

The second species is generally called the Dutch Medlar. This never rises with an upright stalk, but sends out crooked, deformed branches, at a small height from the ground. The leaves of this are very large, entire, and downy on their under-side. The flowers are very large, as are also the fruit, which are rounder and approach nearer to the shape of an apple.

The third species grows naturally in Sicily and the islands of the Archipelago; of this there are several varieties, which differ in the form and size of their leaves, some being cut into five, others into six or seven lobes, which are sometimes sawed on their edges, and others are entire: some of them have oval, large fruit, and others are smaller, rounder, and of different colours, some almost white, others yellow, and some are red.

The fourth species is the common Hawthorn, which is generally cultivated in England for fences, and is one of the best and most durable plants for that purpose we have in this country. There are several varieties of this, which differ in the size of their leaves, the manner in which they are cut, and the size and shape of their fruit: but those with the smallest leaves are the best for close hedges, because their branches grow closer together.

There is also a variety of this with double flowers, which is an ornamental shrub for gardens, for which purpose it is propagated in the nursery.

The Glaffenbury Thorn is also supposed to be only a variety of the common Hawthorn: it differs from it in putting out its leaves very early in the spring, and in flowering twice a year; for in mild seasons it often flowers in November and December, and again at the usual time with the common sort.

The fifth species has much broader leaves than the common Hawthorn, which are divided into three obtuse lobes, which are smooth, slightly sawed on their edges, and of a lucid green on their upper surface. The flowers are larger than those of the common sort, and each foot-stalk sustains three of them; the fruit is of the shape and size of the common Haw, but is of a yellowish white colour.

The sixth species grows naturally in the hedges in the south of France and Italy: it is commonly known by the title of *Pyracantha*, or ever-green Hawthorn; this does not rise to a tree, for the stalks and branches are too slender and weak to stand without support, so the plants are generally planted against walls or buildings to cover them. The flowers come from the sides of the branches in large umbels, they are small and of a dingy white: they are succeeded by roundish, umbilicated berries of a deep red colour, which ripen in the winter, and being intermixed with the ever-green leaves, make a fine appearance at that season of the year.

The seventh species is a native of North America: this is called Cockspur Hawthorn, from the shape of its thorns, which are very strong, and bent downwards like a cockspur. This has a strong stem, which rises ten or twelve feet high, dividing into several branches. The leaves are oval, sawed on their edges, cut into acute angles, and of a light green on their upper side, but pale on their under. The flowers come out in large umbels from the sides, and at the extremities of the branches: they are much larger than those of the common Hawthorn, and are succeeded by fruit, which when ripe is of a beautiful red colour.

The eighth species differs from the seventh in having no thorns on the branches: the leaves are a little deeper sawed on their edges, and not so deeply veined; it is a native of the same country, and grows to as great a size.

The ninth species is a native of North America, where it is a tree of a middling size: it has a few strong strong spines, thinly placed on the young branches. The leaves are spear-shaped, of a lucid green, and indented on their edges. The flowers are as large as those of the former sorts, but the umbels are less: they are succeeded by fruit as large as that of the Cockspur Hawthorn, but a little oval-shaped, of a red colour, and ripens later in the year.

The tenth species does not rise so high as either of the former. The branches are armed with very strong thorns, and shoot horizontally, bending downward, so that they are often interwoven one in another. The leaves are smooth, spear-shaped, sawed on their edges, and of a lucid green. The flowers are placed on the sides of the branches. The fruit is large, roundish, and of a deep red colour when ripe; it is a native of America.

The eleventh species is also a native of North America. It rises with a strong stem about five feet high, dividing into many spreading branches, which are armed with long slender thorns. The leaves are oval, and differ in their form, some are indented at their foot-stalks in shape of a heart, and others are entire at that part: some end in very acute points, and others are obtuse; they are sharply sawed on their edges, of a yellowish green on their upper side, and standing upon slender foot-stalks. The flowers appear on the sides and at the ends of the branches in bunches; the flowers and fruit are of the size and shape of the common Hawthorn.

The twelfth species is a native of Virginia, where it rises to a tree of a middling size. The branches are armed with a few slender thorns. The leaves are oval, oblong, angular, of a lucid green on their upper side, and

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and pale on their under: some are cut so deep on their sides as almost to divide them into lobes, but others are more entire. The flowers, which are very elegant, grow in large umbels at the ends of the branches; they are succeeded by fruit of a beautiful red colour.

The thirteenth species rises with a strong stem to a middling height, dividing into many branches, which have no thorns. The leaves are oval, sharply sawed on their edges, cut into many acute angles, smooth, and of a light yellowish green. The flowers grow at the ends of the branches in close umbels. The fruit is larger than that of the common Hawthorn, but of the same colour.

The fourteenth species has a strong upright stem, sending out many branches which have no thorns. The leaves are oval, spear-shaped, and sawed on their edges. The flowers are placed in large umbels at the ends of the branches, they are succeeded by a red fruit.

The fifteenth species is a tree of a middling growth. The branches are covered with a brown bark, and have no thorns. The leaves are oval, smooth, and of a yellowish green. The flowers are produced at the ends of the branches in small bunches. The fruit is large, in shape somewhat resembling an egg, and of an herbaceous yellow colour when ripe.

The sixteenth species rises about the height of the common Hawthorn. The branches are without spines. The leaves are oval, rounded, sawed, and of a bright green on both sides. The flowers are produced at the ends of the branches: these and the fruit are like those of the common Hawthorn. This and the three preceding sorts are all natives of North America.

The seventeenth species is a native of Virginia. It seldom exceeds the height of seven feet, but sends out a number of slender branches, armed with very long sharp thorns. The leaves are small and sawed on their edges, having short foot stalks. The flowers are placed between the leaves at the ends of the branches. The fruit is small, and when ripe of an herbaceous yellow colour.

The eighteenth species is a native of several parts of Europe. It rises with a number of slender stalks about three feet high, having many side branches without thorns. The leaves are oval, slightly sawed on their edges, woolly on their under-side, but smooth and of a bright green on their upper. The flowers are situated at the ends of the shoots in bunches. The fruit is small, and black when ripe.

The nineteenth species is a native of Canada. It is a low shrub which divides into several branches. The leaves grow upon long slender foot-stalks, they are smooth on both sides, and a little sawed on their edges. The flowers come out in small bunches at the ends of the branches, and are succeeded by a small purple fruit.

The twentieth species rises with a smooth shrubby stalk about four feet high, dividing into a few small branches. The leaves are oval, entire, and have very short foot-stalks. The flowers grow two, and sometimes three together on the sides of the stalks; they are small, of a purplish colour, and are succeeded by a roundish fruit, of a beautiful bright red when ripe. It grows naturally in the colder parts of Europe.

The twenty-first species rises with a smooth stalk about four or five feet high, sending out many slender branches. The leaves are oval, smooth, sawed on their edges, and of a yellowish green. The flowers are situated at the wings of the stalk, and are four or five joined together in a close head; they are succeeded by a small red fruit. It is a native of the northern parts of Europe.

The twenty-second species grows naturally in Crete. It rises with a smooth stalk eight or ten feet high, dividing into many smooth branches. The leaves are oval, of a dark green on their upper side, downy on their under, and standing upon short foot-stalks. The flowers are purple, and grow from the side of the stalk. The fruit is large, round, and of a fine red colour.

Culture of the MEDLAR.

The second species is that chiefly cultivated in orchards for the sake of its fruit; it is propagated by budding or

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grafting it upon the Hawthorn or the Pear-stock, upon either of which it takes very well, and may afterwards be transplanted into the fruit-garden either as standards, or trained up against an espalier: if the latter the fruit will be much larger, but great care must be taken in the pruning not to shorten the bearing branches, for the fruit is nearly all produced at the extremities of these.

The Medlar will succeed on almost any soil, but where it is moist and strong the fruit will grow larger, and on a dry one it will, though smaller, be much better tasted; it should be suffered to remain on the branches till October, at which time it will begin to fall: it should then be gathered in the middle of a dry day, and laid up in a dry place till soft and beginning to decay, which is usually about a month after it is gathered: at this time they are fit for eating, for till then they are too harsh for the palate.

All the other species are hardy enough to live in the open air of this country. The larger growing kinds appear very elegant in parks; they are propagated by seeds, which should be sown in autumn soon after they are ripe. The following spring the plants will come up, when they must be kept clean from weeds, and in very dry weather supplied with water. In two years time they should be transplanted where they are designed to remain. If they are intended for clumps in parks, the ground should be well trenched, and cleansed from the roots of all bad weeds, the places must also be firmly fenced to secure them from cattle. The best time for transplanting them is in autumn, when their leaves fall off; they should be constantly kept clean from weeds, and if the ground between the plants is dug every winter for the first seven years, it will greatly encourage their growth.

The five last mentioned species are only proper for gardens, where, when mixed with other flowering shrubs, they make a beautiful variety. They should always be propagated by seeds, or by laying down the young branches, which, if carefully laid, will take root in one year, and thus they will succeed better than by budding or grafting them upon the stocks of the White Thorn, which is the usual method of propagating them.

MELIA, *Bead-Tree*, a genus of plants, ranged by Linnæus among the *decandria monogynia*, of which there are only two species. 1. Melia, with double pinnated leaves. 2. Melia, with winged leaves.

The first species is a native of Ceylon, and other parts of the east. It is a tree of considerable bigness. The root spreads far; the trunk rises upright and thick, and at some height spreads into many branches. The bark is brown, but on the young twigs green. The leaves are very numerous and large: they are placed in an irregular pinnated manner: some on simple and some on divided ribs; and each pinna, or particular leaf, is oblong, moderately broad, sharp-pointed and serrated. Their colour is a very bright green on the upper side, but on the under paler. The flowers grow at the extremities of the branches in large clusters: they are separately small, and they are placed on long and slender foot-stalks; their colour is a faint purple, paler toward the edges, and somewhat deeper in the middle. The fruit, which follows, is of a rounded form, and soft on the outside: it contains a stone of a roundish shape, but furrowed in five places, and divided within into as many cells, in each of which is contained an oblong seed: the cup in which it stands is small, formed of a single piece, and is divided at the edge into five little upright segments. The body of the flower is composed of five petals, but one is frequently abortive: these are oblong, narrow, and wide expanded, and in their midst rises a nectarium of a peculiar shape; it is long, upright, tubular, and formed of a single piece, divided by ten slight indentings at the edge.

The second species is a native of India, where it becomes a large tree. The stem is thick, the wood of a pale yellow, and the bark of a dark purple colour. The branches extend wide on every side. The leaves are winged, composed of five or six pair of oblong, acute-pointed

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pointed lobes, terminated by an odd one, and have a strong disagreeable odour. The flowers are produced in long branching panicles, which proceed from the sides of the branches; they are small, white, and cut into five acute segments: these are succeeded by oval fruit the size of small olives, which when ripe are yellow; the pulp which surrounds the nut is oily, acrid, and bitter: the nut is white.

Culture of the MELIA.

The first species is propagated by seeds, which it seldom produces in this country: therefore they must be obtained from its native place; these should be sown in pots filled with good, fresh light earth, and plunged into a hot-bed of tanners-bark. When the plants are come up let them be frequently watered and have a large quantity of free air, by raising the glasses every day. In June let them be exposed to the open air, and removed in October under a hot-bed frame. In March following you may shake the plants out of the seed-pots, and divide them, by planting each into a separate small pot filled with light, fresh earth, and plunged into a moderate hot-bed. When the weather is good let them have air as before. During three or four winters, while the plants are young, they must be sheltered, but when they are grown pretty large and woody, they will endure to be planted in the open air.

The second species may be propagated by seed, in the same manner with the first sort, but being much tenderer the plants must be kept constantly in the tan-bed.

MELON, *Melo*, a species of the Cucumber.

The Melons which best deserve culture are, the Cantaleupe, the Romana, the Succado, the Zatte, the small Portugal, and the black Galloway: for our common sorts, and those which most of the trading gardeners around this metropolis raise for the markets, where their size is chiefly regarded, are not worth the trouble and expence bestowed upon them, otherwise than as they bring in a profit to the cultivator.

The Cantaleupe, as it is called, by way of pre-eminence, particularly by the Dutch, who cultivate very few other sorts, and never subjoin the word Melon when they speak of this, though they apply that distinctive appellation to every other kind, is held in the greatest esteem by all the curious in Europe. It derives its name from a place, where the pope has a country seat, about fourteen miles from Rome, where it has long been cultivated: but it was first brought thither from that part of Armenia which borders on Persia, where this fruit grows naturally in vast abundance. Its outer-coat is very rough, full of knots and wart-like protuberances; and its flesh, which is generally of an orange colour, though it is green in some, but these are not so good, is singularly delicious, when in perfection, and remarkable for the safety with which it may be eaten; for it does not offend even the most tender stomachs.

The Romana is a good Melon, when it is well conditioned, and produced by a perfectly healthy plant, in a dry season. It may be ripened sooner than the Cantaleupe, and therefore merits the attention of those who are fond of having early Melons.

The Succado is also a very good sort, and will yield early fruit: but neither it, nor the Romana, can be compared to the Cantaleupe, when this last is in season.

The Zatte Melon is likewise well tasted; but its fruit is so very small (seldom exceeding the size of an orange), and the flesh in it so little, that it is scarcely worth cultivation. It is somewhat flat at both ends, and its coat is warranted like that of the Cantaleupe.

The small Portugal Melon, which some call the Dormer Melon, may also be cultivated for an early crop. It is a pretty good fruit, and grows plentifully; for which reason people who choose quantity rather than quality, and many whose palates are not nice, give it a sort of preference to most other sorts: but it falls greatly short of the Cantaleupe, in point of flavour.

The black Galloway, which was brought from Portugal, many years ago, by Lord Galloway, is the best of

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all Melons for an early crop; for it will ripen in a shorter time from the setting of it, than any other sort; and its fruit is by no means bad when it is suffered to ripen naturally. The seeds of the right black Galloway are, indeed, not easily met with now in this country; because it has degenerated by growing among other sorts, the male dust of whose blossoms has been waisted to, and has impregnated, the flowers: for, to preserve any particular sort of Melon in perfection, no other plant of a different kind, though of the same genus, no cucumber, no gourd, nor any similar growth, should be permitted to blow near it.

To the want of care in this important, though too generally unheeded, caution, is owing the complaint of many lovers of this fruit, who, not knowing the true cause, have imputed the gradual diminution of the goodness of their Melons to their having been too long cultivated from seeds saved in the same garden, and have therefore held it to be absolutely necessary to procure a frequent change of seeds from distant parts. That a change of seeds now and then is beneficial, and even advisable, is readily allowed in regard to this, as well as for all other vegetables; but the great difficulty is, to get them from people who have saved them with due care; for all hired, or otherwise mercenary, gardeners, are apt to be very negligent in this respect. Nor should the seeds brought from abroad, either by those who import them for sale, or by gentlemen, be absolutely depended upon; for in Italy, Spain, Portugal, and many parts of France, the gardeners are very careless in the choice of all their seeds, but of the Melons they are remarkably so; and as for those which come from Constantinople, Aleppo, and other parts of Turkey, it is rare to see one tolerable Melon produced from those seeds.

Melon seeds should be at least three years old, and not more than six, or at most seven, when they are sown: for though they will grow at the age of ten or twelve years, and at less than three, yet the fruit produced by them will, like that of light seeds which swim upon the water when taken out of the pulp, not be near so thick fleshed, so firm, so moist, or so well tasted, as what is raised from heavy seeds kept to a proper time, even though they be taken out of the same Melons.

Culture of the MELON.

The culture of all sorts of Melons, of which there are many varieties besides the above-mentioned, though not of value enough to be particularised here, is exactly the same. The two first sowings of them, that is to say, those made in March, should be under frames, and therefore these may be placed at the upper side of a cucumber-bed, if there be one in readiness; otherwise a hot-bed must be made on purpose for them, with new horse-dung, in the manner before directed for cucumbers, like which they are to be raised and managed in all respects, till they are planted out where they are to remain. The third sowing, of which the plants are generally reared under bell or hand-glasses, or under frames covered with oiled paper, should not be earlier than the tenth or twelfth of April, lest these plants, if they thrive well, should extend their shoots to the sides of the glasses before it will be safe to let them run out, on account of the sharp morning frosts which are frequent in this country even in the middle of May: nor must they, on the other hand, be cramped in the glasses, because they would then be in equal danger from the heat of the sun in the day-time. If they do grow so as to exceed the limits of their glasses sooner than it may be safe to expose them to the air, the projecting ends of their vines must, in that case, be sheltered with mats, to defend them from the cold. For these reasons it is most advisable to set the seeds of such plants as are to be reared under hand-glasses, a little later than those which are intended for the much more spacious coverings of oiled paper: and likewise for the same reasons, it is best in this climate, not to attempt to have Melons ripe earlier than the middle of June, from which time they may be had in plenty till the end of September, if they are rightly managed.

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When the beds, or, as the gardeners term them, the ridges, in which these plants are to be set to remain, are of a proper warmth, a covering of two inches thick of mould will be sufficient to begin with, except in the middle of each light, where a hill of it should be raised eighteen inches high, or more, terminating in a flat cone, in the top of which the plants are to be placed. In two or three days, this will be sufficiently warmed to receive the plants, which always succeed best when they are transplanted young; and the most proper time for removing them is the evening, when a little wind is stirring. They should be carefully taken up with a trowel, so as to preserve all their fibres, and as much earth as possible about them; for these plants are much tenderer than those of cucumbers. The Cantaleupe Melon is particularly so: for it will be long before that recovers itself, after being transplanted, and if this is not done soon after it has put out its third, or what the gardeners call its rough leaf. If this happens before the beds are ready, the best way is, particularly for the Cantaleupe, which requires the nicest management, to take up the plants, as soon as they are fit for removing, to put each of them into a separate small garden pot, and then to plunge these into the hot-bed where they were raised, or into a cucumber-bed, if there be room, in order that they may be brought forward; and when the bed or ridge where they are to remain is ready, they may be turned out of the pots, with all the earth about their roots, so as not to receive any check by the transplanting. This may be the more easily done, as only one Melon plant should be suffered to grow in each light, and there will not be any danger of hurting their roots when they are removed in this way. When they are well placed on the top of the little mounts, or hillocks, before-mentioned, they should be watered gently, and this should be repeated once or twice, till they have taken good root, after which more water will seldom be wanted, or advisable; because too much wet makes them canker at the root, and then they never produce good fruit. When the plants are well fixed in this new bed, a greater quantity of earth should be laid on it, beginning at the hillocks, that their roots may be enabled to strike out horizontally; and as this earth is added from time to time, it should be pressed or trodden down as close as possible, till it is at last raised at least a foot and a half thick upon the dung all over the bed. The frames should also be raised in proportion, that their glasses may not be so near the plants, as to make the sun scorch them: but in this raising of the frames, great care must be taken to stop every crevice all around, so that no cold air may be able to penetrate through them.

The earth, which the Dutch and German gardeners, who are very exact in that respect, lay upon these beds, consists of one third of hazel loam, one third of the scouring of ponds or ditches, and one third of very rotten dung. They prepare this compost at least one year, but oftener two years, before they use it; frequently turning it during that time, the more thoroughly to blend and sweeten it: but Mr. Miller has found, by experience, that Melons succeed best in this country, when they are planted in two thirds of fresh gentle loam, and one third of rotten neats dung, well mixed, and frequently turned over during one year before they are wanted, so as to enable them to enjoy all the benefit of a winter's frost and summer's heat; and of this a sufficient heap should always be kept in readiness, under a shed, well sheltered from heavy rains, which would carry off its goodness.

When the plants have four leaves, and consequently a joint, their tops above that joint should be pinched off with the finger and thumb, to make them put out lateral branches. for these are to produce the fruit; and when there are two or three of these branches, their extremities must also be pinched off, as soon as they have got two or three joints, to force out more, and these again must be treated in the same manner, that there may be runners enough, as the gardeners call them, to cover the bed. Care must be taken not to bruise the plants, when the tips of their shoots are thus pinched off, nor must they

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be cut with a knife, because the wound will not heal soon in either of these cases. Neither should a greater number of lateral shoots than is necessary to cover the bed properly, be forced out by cropping off their ends, lest more fruit should be produced than the plant can possibly nourish. The farther management of these plants is the same as that of cucumbers, only it is to be observed, that Melons require a greater share of air than cucumbers, and very little water; and that when they are watered, it should always be at a distance from their stems.

If the plants raised in frames succeed well, their vines will extend over the bed, and reach to the frames, in about six weeks, at the end of which the alleys between the beds should be dug up; or, if there is but one bed, a trench about four feet wide should be dug on each side of it, as deep as the bottom of the bed. A sufficient quantity of hot dung should then be trodden down closely to it, till this dung is as high as that of the bed, and this additional breadth should be covered with the same sort of earth as was used for the bed. This earth should also be trodden down as close as possible, and the whole bed should by these means be enlarged to the breadth of twelve feet; for the roots of the plants will extend themselves to very near that distance: but if they should reach farther than they are covered, and their extremities be consequently dried by the sun and air, the plants themselves will gradually languish and decay, or at best produce but meagre, meally, and ill-flavoured fruit; whereas those which have a sufficient breadth and depth of well trodden earth for their roots to run in, will remain in vigour till the frost destroys them. The languishing of the plants, for want of sufficient room to extend their roots, frequently before the fruit is full grown, and even sometimes before it is well formed, may soon be discovered by the drooping of their leaves in the middle of the day, and a then speedy total decay of many of those leaves. It is owing to their not having enlarged the beds, as above directed, or even made them at all wider than they were at first, or increased the original depth of the mould upon them, which perhaps did not exceed the common allowance of about three inches, that many people have seen their plants of Cantaleupe Melons pine away, and perish, before they had ripened a single fruit; and then have imputed to their tenderness, which they think too great for this climate, a miscarriage which was entirely owing to their not understanding the right method of cultivating them.

When the vines have extended so far as to fill the frames, and consequently to want more room, the frames should be raised up about three inches above the surface of the bed, and set upon a few bricks, at that height, in order that the shoots may have room to run out under them: for if the plants are vigorous, these branches will reach to the distance of six or seven feet every way from their stem. It therefore is evidently best, not to put more than one plant under each light; and the more so as its fruit will seldom set well if the vines are crowded, but will drop off when about the bigness of an egg. The addition of the warm dung before-mentioned, on each side of the bed, will indeed, by reviving the heat of the dung in the bed, be of great service to the setting of the fruit, especially if the season should prove cold, as it sometimes is with us till the very end of May; and this is surely no small advantage accruing from that method. To second it properly, the frames for Melons should not be made so small as is the general custom; for the wider they are, the better the plants will thrive, and the greater quantity of fruit they will produce.

If the weather should become cold after the plants have extended themselves from under the frames, it will be right to cover the extremities of their vines every night with mats, during the continuance of the cold; for if they are injured, the growth of the fruit will be retarded, and the plants themselves may be hurt essentially. Care should also be taken after this enlargement of the beds, that what water is given to the plants be poured only in the alleys between the beds, or towards the outside of the space added to them; for their roots will now have extended

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tended so far as to reap the benefit of any such watering, and their stems will continue the sounder for being kept dry.

This watering should be pretty plentiful when it is given; but it should not be repeated above once a week, even in the driest weather: and, on the other hand, the plants should be aired as much as possible when the season is warm.

The plants of Melons intended to be reared under bell or hand glasses, should be raised in the same manner as those before-mentioned; and the beds, or ridges, for them should be made by the latter end of April, if the season is forward. A sufficient quantity of hot dung should therefore be provided for this purpose, so as to allow eight or nine good wheel-barrow loads of it to each glass. When there is but one bed, and that is to be extended in length, the trench for it should be dug four feet wide, and its length should be proportioned to the intended number of glasses, which should stand at least four feet asunder: for if the plants are too close to each other, their vines will intermix and entangle, and crowd the bed so as to prevent the setting of the fruit. This trench should be so situated, that there may be room for widening the bed two or three feet on each side. Its depth must depend on the nature of the soil, as was before observed: but if the ground is so dry as to obviate all danger of the bed's being hurt by wet, it cannot well be dug too deep. After the dung is spread, trodden down, and flatted in the trench, as already directed, a hill of earth (such as was before advised will be the best) should be raised eighteen inches high, with a flat head, in the middle of each spot where a plant is to be set; but the rest of the bed need not yet be covered above four inches thick; for that will be sufficient to prevent the evaporation of the warmth of the dung. The glasses should then be set down close, over the hills, that these may be warmed so as to be fit to receive the plants, which they will be in two or three days, if the bed works kindly, and then the plants should be set in the top of the hills, in the manner before directed. If they are taken out of pots, with all the earth about their roots, only one should be set under each glass, because there will not then be any danger of their dying; but if they are transplanted directly from the seedling-bed, it will be right to plant two upon each hill, and afterwards to remove one of them, if they both grow. These plants must be watered when they are first set, to bring the earth the closer to their roots. They must also be shaded every day, till they have taken new root; and if the nights prove cold, the glasses should be covered with mats, the better to preserve the warmth of the bed.

When several of these beds are made, they should stand eight feet asunder at first, that there may be between them a proper space, which is afterwards to be filled up, in order to enlarge them so that the roots of the vines may have room to extend themselves every way, for the reasons before assigned.

When these plants have taken good root, their tops must be pinched off as before directed for those in the frames; and the glasses should be raised up in the day time, in warm weather, on the side opposite to the wind, to let in fresh air to the plants, which will otherwise be drawn up weak and sickly: a state which all possible care should be taken to prevent, because their runners cannot supply the fruit with due nourishment, if they themselves have not proper strength.

If the weather be favourable, the glasses should be raised two or three inches high from the surface of the beds, and set upon three bricks, as soon as the plants are grown long enough to touch their sides, in order to give the vines room to run out from under them; but it is essential to observe, that, when this is done, the whole bed should be covered with earth to the depth of eighteen inches; that this earth should be trodden down as close as possible; and that, if the nights should prove frosty, a covering of mats should be carefully spread over the beds, to guard the tender shoots of the plants from the cold. It is also to be observed, with regard to the Cantaloupe Melon in particular, that, as the vines of this

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fort cannot endure wet, the beds where it grows should be arched over with hoops, to support the mats, and that these should be held in readiness to be used at a moment's warning, either against cold or rain: for this is the only way to have these Melons succeed in so variable a climate as ours.

If the weather should prove cold after the bed is covered with the proper thickness of earth, well trodden down, it will be advisable to dig a trench along each side of it, or, if there are more beds than one, to dig out their intermediate space, then to fill this, or the trenches, with hot dung, up to the height of the adjoining bed, and to cover this dung with an equal depth of well trodden down earth, as before directed. This new dung will revive the warmth of the former beds, and soon make the plants shew their fruit. The watering of them, pinching off their tops, and, in short, every other part of their management, must be the same as before directed for those under frames: but a farther care requisite here, is, to cover them with mats in all hard rains and cold nights. If all this is rightly performed, these plants will remain vigorous until the cold in autumn destroys them.

The oiled paper coverings are a late invention; but they have been found to succeed admirably well when rightly managed. The chief thing to be attended to when they are used, is, not to keep them down too close over the plants; for then the Melon vines will waste themselves by running out in length, and will be so weak as rarely to set their fruit in any plenty. The best way therefore is, where these coverings are intended to be used, to raise the plants under bell or hand-glasses, as before directed, till they are grown large enough to be released from those glasses; and then, instead of mats, to use this oiled paper covering, which, if it be prudently managed, will answer every end that can be desired.

To make this covering, a number of sheets of strong, but not too dark-coloured, paper should be pasted together so as to over-spread the frame intended to be used; and these should then be fastened to the frame, and rubbed well over with linseed oil, which will dry soon; for all the stench should be gone off before it is put over the plants, because they will otherwise be hurt thereby. Pan-tile laths put together in the shape of the ridge of a house, with hinges to each slope, whereby any of the pannels may be raised at pleasure, to let air in to the plants, are the best materials, and the best form, for these frames; for when they are made with broad hoops, like the tilts of waggons, they are cumbersome to move, and no air can be admitted to the plants, but by raising up one whole side of the frame; which is very inconvenient.

When the vines begin to put forth their fruit, which they will do in plenty soon after the bearing runners shall have been produced by nipping off, in the manner before advised, first the top of the plant, as soon as it has one joint, and then the ends of the earliest lateral shoots when they have two or three joints, they should be carefully looked over thrice a week, to observe the setting of the young Melons, and single out, upon each runner, that only which seems to be the strongest fruit, which has the thickest foot-stalk, and which is situated nearest to the stem. All the others should then be pinched off; and the end of the runner upon which a Melon has been thus chosen should also then be nipped off at the third joint above the selected fruit, to stop the sap and set the Melon: but none of the ends of these bearing runners should ever be broken off before the particular fruit has been culled out, because that would only make them produce more shoots, which would weaken the plant, and draw away the nourishment necessary for the fruit. For this reason, if any new shoots do break out, or any young fruit appears, after the above precautions in favour of that which is intended to remain have been taken, they should be nipped off immediately; for if many of them are suffered to grow, they will absolutely impoverish the plant to such a degree, that it would not be surprizing to see all the fruit drop off when it comes to be

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be about as big as a man's thumb. One young Melon is as much as ought to be left upon any one runner; for, if but half of these stand, they will be full as many as the plant can nourish. Six or eight of the Cantaleupes, whose flesh is thick, are full enough for the strongest plant of that kind; and though some smaller sorts may be ripened in greater numbers, even unto fifteen or twenty upon one plant, they will be thinner and poorer than if they were less numerous.

For plants which are so confined under frames, that the wind requisite to convey the farina from the male flowers to the female is excluded, it is the practice of several gardeners, and perhaps it may there be even a necessary one, to take off some of the male flowers whose farina is just ripe and fit for the purpose, and, inverting them over the female flowers situated on the crown of the young fruit, to strike the former gently with the tip of a finger, so as to shake its farina into the latter; for by this means the female flower will almost surely be impregnated, and if it is, its fruit will swell soon after, and shew manifest signs of being perfectly set: but, from the time that the fruit appears on the vines, the glasses should be constantly taken off in good weather, or the fruit will seldom form in any plenty.

As the Melons draw towards ripening, they should be turned gently twice a week, that every part of them may receive equal benefit from the sun and air; for if the same side is suffered to lie continually downward, in which situation it will be deprived of both those advantages, that side will become pale, or whitish, as if it were blanched.

Besides airing the plants as much as possible when the weather will permit, they will also require to be watered in very dry weather, and perhaps most particularly after they have been pruned: but this, as was before observed, should be done with great care not to wet their stems, by pouring the water only in the alleys, at a distance from them: nor should it be repeated oftener than once in a week or ten days. Then, indeed, the alleys should be well soaked, to forward the growth of the fruit, and render it thick fleshed: though it is essentially necessary not to over-water the plants.

The goodness of all Melons depends greatly on their being cut at a proper degree of maturity. The Cantaleupe, in particular, is so very nice in this respect, that it will lose much of its delicacy if it be left but a few hours too long upon the vines. The beds should therefore be looked over at least twice every day when the fruit is ripening; and if those which are intended for the table are cut early in the morning, before the sun has warmed them, and laid by in a cool place till they are used, their flavour will be much better than if they are gathered later in the day, and served up directly. Such as are cut afterwards, when the heat of the day has affected them, should be put into a pail of cold spring water, or ice, to cool them, before they are set upon the table.

A sure sign of maturity in the Cantaleupe Melon is, its beginning to crack at the foot-stalk, and to emit a fragrant smell. Whenever this happens, the fruit should be cut directly; for this sort seldom changes its colour as the others do, and only a few hours delay will render it too ripe, as was before observed.

The best seeds of Melons are those which are taken from the firmest and highest flavoured fruit; and if they are scooped out with the entire pulp, so as not to displace them, and left in it for two or three days before they are washed out, they will be benefited thereby. None but the heavy seeds, which sink in the water, are worth saving.

Water MELON, or *CITRUL*, *Anguria*, considered by Linnæus as a species of the Gourd, but a distinct genus according to other botanists.

Culture of the Water-MELON.

The seeds of this Melon may be sown in the hot-bed for early cucumbers; and at the beginning of February a quantity of dung should be thrown in a heap for about twelve days; at which time it will be of a proper heat to make a bed with; this should be covered three inches thick with loamy earth; raising hills on it of the same earth a foot and a half high, over which a three-light frame should be placed, and when the bed is of a proper

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temper, the plants must be placed on it, one in the center-light of each frame, observing to water and shade them till they have taken good root, fresh air must always be admitted to these plants, by raising the glasses in proportion to the warmth of the weather. As the branches extend, care should be taken to lead the shoots as they are produced, so as to fill each part of the frame, but not to crowd each other; they must be frequently weeded and watered, giving them but little at a time; and observe to keep the beds to a good temperature of heat. When the fruit appears admit air freely to the plants, in order to set it; but when the nights are cold, the glasses must be covered with mats to keep the beds warm.

MELON-THISTLE, *Caltus*, a genus of plants of which there are six species. 1. Great, or Hedge-hog Melon-Thistle. 2. Melon-Thistle with erect spines. 3. Melon-Thistle with broad recurved spines. 4. Melon-Thistle with long white recurved spines. 5. Small Childing Melon-Thistle. 6. Small American Melon-Thistle.

We shall confine ourselves to the description and culture of the last species, as it will be a sufficient direction to the gardener for that of the rest.

It is a native of America, where it covers the surface of rocky hills. The root is divided, spreading, and full of fibres. The plant bursts at once from the surface, without stalks or leaves; in form of a globular green mass, with an uneven surface, this rises in height, but alters its form in nothing, except that the whole becomes somewhat oblong, and the rough surface breaks into more distinct tubercles. When arrived at the full growth, it is seven inches high, bulky, cylindric, nearly of equal thickness throughout; and flattened at the top. Its colour, which at the first appearance was an obscure green, becomes paler and brighter, and toward the ground is often stained with purple. The whole is composed of oval tubercles, which are smooth on the surface, clustered at the base, and armed at the top with brown and glossy thorns. The flowers add little to its beauty, they are very small, of a white colour, and placed among the tubercles. These are succeeded by fruit of an oblong form, and a moderate size; when perfectly ripe, its colour is a fine crimson, lightly tinged with purple: this continues fresh upon the plants during the winter; and they make a most beautiful appearance at that season.

The juice of the fruit is purple, and not ill tasted, and the seeds mixed among it are small and black. If the whole plant is cut transversely, it is found to be composed of a tender substance, not unlike that of an unripe cucumber; but of a greenish colour. The taste is acrid, and there runs out a milky juice from the exterior part near the bases of the tubercles, more sharp in taste than the flesh.

Culture of the MELON-THISTLE.

It is propagated by seeds, which should be sown in pots filled with light earth, and plunged into a bark-bed. When the plants appear let them be thinned, so as to leave three or four in a pot, allow them a few gentle waterings, and by degrees inure them to the air. In a short time they will be of a size fit to remove into separate pots; this must be performed with great care, and the plants by no means buried in their lowest part. They must have a little water, and be shaded in the heat of the day till they have taken root; and towards autumn they must be taken into the stove, where they should have but very little water. When young plants appear in the pots at the bottom of the old ones, they always rise from fallen seeds, and may be planted into separate pots, and treated in the manner directed for the seedlings. By such management the plants ripen their seeds freely in this country.

MENTZELIA, a genus of plants which has no English name, and only one species.

It is a native of La Vera Cruz, where it rises with a slender, smooth, stiff stalk, a little woody, more than three feet high, branching out alternately at distances; the branches are distorted, and run into one another. The leaves are shaped like the point of a halbert, stand-

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ing alternately upon short foot-stalks, covered with short hooked prickles. The flowers come out singly from the joints of the stalks, resting upon a cylindrical germen, which is near an inch in length, narrow at the base, but wider upward. Upon the top of it comes out the empalement: the flowers are of a pale yellow colour. In the middle rises a great number of stamina which are erect, terminated by single summits; from the germen rises a single style, crowned by a single stigma. The germen afterwards turns to a long cylindrical capsule, armed with prickles as the leaves; these have but one cell, which is filled with small seeds.

Culture of the MENTZELIA.

This is an annual plant, and is propagated by seeds which should be sown on a hot-bed early in the season, that the plants may be brought forward in the spring, otherwise they will not produce ripe seed in this country. When the plants are come up about an inch high, they should be each transplanted into a separate pot, and plunged into a hot-bed of tanner's bark, being careful to shade them from the sun until they have taken new root; they are then to be treated in the same manner as other tender annual plants.

MERCURY, *Mercurialis*, a genus of plants ranged by Linnæus among the *dioecia enneandria*. There are four species of it, one only of which is found in gardens, viz. Mercury with a shrubby stalk, and woolly leaves; another of the species is a native of Africa, and the rest grow commonly as weeds in gardens, and upon dung-hills.

Culture of the MERCURY.

If the seeds of this species are permitted to scatter, the plants will come up the following spring. The seeds should be sown in autumn, because those seeds which are sown in the spring, never grow the same year. This plant requires a warm situation, and a dry, rubbishy soil, in which it will live three or four years.

English MERCURY, a species of Goose-Foot. See the article GOOSE FOOT.

MEUM, a species of Spiguel. See the article SPIGUEL.

MEZEREON, a species of Daphne. See the article DAPHNE.

MILDEW, *Rubigo*, a disease happening to plants caused by a dewy moisture, supposed by some to be a species of blight, though others make them very different. See the article BLIGHT.

The Mildew, properly so called, sometimes rests upon the leaves of trees in form of a fatty juice; it is tough and viscous to the touch, and the sun's heat drying it up, it becomes yet more viscous and hard. The most happy remedy for this is a smart shower of rain, and immediately afterwards a brisk wind, which wholly disperses it.

MILFOIL, a species of Achillea. See the article ACHILLEA.

MILKWORT, *Polygala*, a genus of plants ranged by Linnæus among the *diadelphia hexandria*, of which he distinguishes no less than twenty-two species, some of which grow naturally in Europe, and others in Asia, Africa, and America, but the three following only are to be met with in the English gardens. 1. Milkwort with crested flowers, a moon-shaped keel, and a shrubby stalk, bearing oblong leaves, which end in obtuse petals. 2. Milkwort with flowers growing thinly, and without beards, the point of the keel roundish, a shrubby stalk, and spear-shaped leaves. 3. Milkwort with spiked flowers, without beards, an erect, single, herbaceous stalk, and broad spear-shaped leaves, commonly called Senega Rattle-snake-wort.

The first species is a shrubby plant, and a native of Ethiopia. The second grows naturally in Africa, Switzerland, and the mountains of Alfatia; and the third in Virginia, Pennsylvania, and Maryland.

Culture of the MILKWORT.

The first species may be propagated by cuttings, but the best method is to raise it from seeds, which some years ripen very well in England, and should be sown soon after they are ripe, in small pots filled with light loamy

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earth; let the pots be placed where they have the morning sun only, till October; when they should be removed under a hot-bed frame, and plunged into old tanner's bark which has lost its heat; and here let them be defended from frost during the winter. In the spring let the pots be plunged into a moderate hot-bed, and when the plants appear, let them have a large share of free air admitted to them; when they are fit to be transplanted, let them be taken out of the pots, and planted each into a small pot, filled with light loamy earth. Let the pots be plunged into a moderate hot-bed, observing to shade them from the sun, and let the plants be gently refreshed with water; when they have taken root they should be gradually inured to bear the open air, and in June you may place them abroad in a sheltered situation, where they may remain, if the season proves favourable, to the end of October; when they should be removed into the green-house, and the succeeding Midsummer set them out among the green-house plants.

The second species is cultivated by seeds, which should be sown soon after they are ripe in pots. Let the pots be plunged in the ground, where they may have but little sun, and let them be protected from severe frosts. After the plants come up, the pots should be placed in the shade during the summer, and in autumn the plants may be turned out of the pots, and planted in a border where they should have only the morning sun. If the winter proves severe, it will be proper to cover the surface of the ground about their roots with mulch, to keep out the frosts.

The third species is propagated by planting the roots, which may be procured from the place where they grow naturally; they should have a sheltered situation, and be planted in a bed of light earth. In summer they should be kept clean from weeds, and in winter the ground about their roots should be covered with old tanner's bark, or any other kind of mulch, to keep out the frost.

MILLERIA, a genus of plants of which there are five species. 1. Milleria with heart-shaped leaves, and foot-stalks arising from the division of the stalks. 2. Milleria with the lower leaves oval, heart-shaped, acute-pointed, and rough, and the upper ones oval, spear-shaped, and pointed. 3. Milleria with oval leaves, and simple foot-stalks. 4. Milleria with oval, spear-shaped, acute-pointed leaves, having three veins, and foot-stalks proceeding from the wings of the leaves. 5. Milleria with rough, spear-shaped leaves, and flowers growing in clusters from the wings of the stalks.

These are all shrubby plants, and natives of Campeachy.

Culture of the MILLERIA.

All the species are propagated by seeds, which should be sown early in the spring on a moderate hot-bed. When the plants are about two inches high, they should be each transplanted into a separate pot filled with light rich earth, and then plunged into a moderate hot-bed of tanner's bark, where they must be shaded from the sun till they have taken root, and watered frequently.

After the plants are rooted, they should have a large share of free air admitted to them, and in a month's time they will be fit to transplant into larger pots; these must be plunged into the bark-bed in the stove, where they may have room to grow, especially the first and second species, which, with the above management, will grow very high, and branch out extremely; but the other sorts seldom rise above four feet, and do not spread their branches very far, so that they require less room.

In the middle of July these plants will begin to flower, and continue doing so till Michaelmas, or later, if the season proves favourable, but when the cold weather comes on, they soon decay.

MIMULUS, a genus of plants ranged by Linnæus among the *didynamia angiospermia*, and of which there is only one species.

It is a native of North America. The root is formed of many fibres connected to an oblong head. The stalk is round, purplish at the bottom, and toward the top whitish, with some green. The leaves are of a beautiful shape

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shape and colour, they are oblong, broad at the base, where they encompass the stalk, and sharp at the point: of a fine strong green, and not serrated at the edges. The plant does not send out many branches, so that its flowers regularly and beautifully rise on long foot-stalks from near the middle, to the top. These are of a very fine violet blue, sometimes tinged with reddish: and each of them is succeeded by an oval capsule, in which are many seeds. The body of the flower consists but of one petal, and it has a gaping aspect. The tubular part is gradually expanded, and at the verge opens into a considerable breadth, and is cut into two lips. The upper one is split at its top, and turns back at the edges: the lower lip is broader, and is divided into three round parts; and at the base of this lip there appears a swelling palate. When the flower first opens, these parts are confused, and when it begins to fade, they in some measure lose their form: when it is just in perfection, they are to be seen regularly; and the flowers are then very elegant, as well as peculiar in their form.

Culture of the MIMULUS.

It is propagated by seeds which, if it is possible, should be procured from America, if not, let them be carefully saved from plants growing here.

Let four pots of a middling size be filled with earth, taken from under the turf in an upland pasture, without any addition. Set these in some part of the garden open to the morning sun, and defended from cold winds, and in the beginning of December, scatter upon the surface a few of the seeds. Sprinkle over them a very light covering of the same earth. In spring there will be seen several young plants in each pot; when these have some little height, let the strongest plant that stands near the middle of each pot be marked, and carefully draw up all the others; these may be planted in common ground to take their chance; and the rest must be left one in each pot to rise gradually. In summer let them be set out among the green-house plants, and give them but little water; this will keep them from growing too large, and will keep back their flowering for that late season, when they will be most valued. At the approach of winter, let them be taken into the green-house, and when the top flowers are past, let those be taken off, and not left for seed; and thus it will continue a long time in beauty.

MINT, *Mentha*, a genus of plants ranged by Linnæus among the *didynamia gymnospermia*; of which he enumerates ten species. 1. Mint with spiked flowers, and heart-shaped, indented, waved sessile leaves, being the Danish, or German curled Mint. 2. Mint with spiked flowers, and oblong sawed leaves, commonly called Spear-Mint. 3. Mint with flowers growing in heads, oval, sawed leaves, upon foot-stalks, and stamina longer than the petals, or the great round-leaved Water-mint. 4. Mint with flowers growing in heads, and spear-shaped sawed leaves, upon very short foot-stalks, called Pepper-mint. 5. Mint, with flowers growing in whorls, oval, acute, sawed leaves, and stamina shorter than the petals, or the Calamint. 6. Mint with flowers growing in whorls, oval, acute, sawed leaves, and stamina equaling the petals. 7. Mint with flowers growing in whorls, and spear-shaped, sawed leaves, upon foot-stalks. 8. Mint, with flowers growing in whorls, oval, obtuse, crenated leaves, and creeping, taper stalks. 9. Mint, with flowers growing in whorls, and linear leaves, or the narrow-leaved Pulegium, or Pennyroyal. 10. Mint, with flowers growing in heads, round a divided stalk, oval, crenated leaves, and a woody stalk.

Most of these species are natives of this country. The seventh grows naturally in Canada; and the tenth is a native of the Canary Islands.

Culture of the MINT.

These are all perennial plants, and may be propagated by parting the roots in the spring, or by planting cuttings in any of the summer months, but they must have a moist soil, and if the weather proves dry, they must be often watered till they have taken root. They should be planted in beds of four feet width, with walks two feet wide between them, and should be set at five inches distance. They spread so fast at the roots, that the bed

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should never stand above three years before they are taken up and transplanted; for the roots after this time will mat and clog together so as to choak one another.

When Mint is cut for distilling, or for any medicinal use, it should be done in very dry weather, when the plants are just coming into bloom: for they are fullest of sap, and highest in flavour, at that point of time. What is then cut should be hung up to dry in a shady place, till it is wanted for use: but care must be taken not to hang it against a wall, because this will make it turn black and mouldy. The same will also happen to Mint that is cut in wet weather.

If the soil be fit for this plant, it will afford three general cuttings every year: but those shoots which come out after July, are seldom good for much. These should therefore be let stand till Michaelmas, when it will be right to cut the whole down close to the ground, and, after carefully clearing away all the weeds, to sift a little fine rich earth all over the beds, to the thickness of about an inch. This will give vigour to the roots left in the ground, and will make them shoot out finely the next spring.

Tree MINT, a genus of plants, ranged by Linnæus among the *didynamia monogynia*, and of which there is only one species.

The root of this plant is woody, brown, and divided into numerous parts. The stem, in its natural place of growth, often rises naked to twelve feet in height, but here it seldom exceeds four or five feet, and is always branched from the bottom. The outer bark is brown, and on the small shoots has a tinge of red: the inner rind is green. The young shoots are square, in the manner of the stalks of our common Mints; but as they grow more firm, they lose their angles and become round: they have also a downy matter hung about them at first, which falls off as they grow harder. The leaves stand naturally in pairs, but not invariable: they have long, brownish, woody foot-stalks, and they are of an oval form, bluntly indented at the edges, and obtuse at the end; their colour on the upper side is a fine pale green, and on the under they are white and hoary. The young stalks are also hairy, and the upper side of the leaves, though less distinct. The flowers are very numerous, naturally of a snow-white, but sometimes tinged a little with a blush of red; they are singly small, but they stand collected in thick heads or round clusters, and they have hairy cups, which are very conspicuous. The foot-stalks which support these rise from the bosoms of the leaves, from top to bottom of the plant, and they naturally divide into two parts when they have reached about two thirds of their length: these separate parts support each a tuft of flowers. The whole plant has an aromatic smell when bruised. The cup in which each is placed is formed of a single piece, and tubular at the bottom, nipped at the rim into five segments. The body of the flower is formed of a petal, tubular, and divided at the rim into four segments, of which the upper one is broader than the rest, and nipped at the top. In the body of the flower stand six filaments, crowned with roundish buttons; in the midst of these rises a single style from a slight rudiment of a fruit, rising in four ridges; this should ripen into four distinct seeds, but the Mints in general have them often abortive.

Culture of the Tree MINT.

It is a native of the Canaries, where it thrives best in a rich, light, but not too dry soil. This we must imitate in the compost made to receive it, and with the winter shelter of a green-house it may be raised to all the strength and vigour of its natural growth. The best compost is as follows.

Dig a barrow of good, rich black mould from under the turf in a meadow: mix with this an equal quantity of pond-mud, a bushel of coarse-sand, and a peck of hogs dung: throw this in a heap, and turn it frequently.

In this compost the shrub may be raised either by seeds or cuttings, but the latter is much the better method, it saves a great deal of trouble, and the plants are stronger. If there be a necessity of raising it from seeds, from

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from the want of opportunities to procure cuttings, care must be taken to get the seeds from the Canaries, for it very rarely ripens them here, and even then so imperfectly, that not one in fifty grows; therefore to raise a few plants a greater quantity of seed should be sown, and it must have the assistance of a hot-bed in spring: from the young plants must be removed to a second, and then into pots, as we have directed for raising other green-house plants.

The cuttings should be procured from a flourishing shrub, and in the beginning of April planted in pots of the compost. These must be set in a bark-bed of very moderate heat, and when they have taken root they may be brought out by degrees among the green-house plants, after which they will require only the common care; they must be housed early, and they require frequent waterings.

Cat's MINT, or **NEP**, *Nepeta*, a genus of plants, ranged by Linnæus among the *didynamia gymnospermia*: there are twelve species of it which are not worth particularizing.

Culture of the Cat's MINT.

All the species of Cat's Mint are perennial plants, easily propagated by seeds, which may be sown either in spring or autumn, upon a poor, dry soil; or if they are permitted to fall the plants will come up without any further trouble, but to thin them where they grow too close, and to keep them clean from weeds.

MITCHELLA, a genus of plants, of which there is only one species.

This elegant little plant is a native of North America. The root is composed of many long fibres, connected to a small head. The stalk is round, and not very firm, stained towards the ground with red, and the rest of a pale green. The leaves are placed in pairs: they are small, oval, and of a fresh green, lightly ribbed, and supported on slender foot-stalks. The flowers terminate the stalk, and two naturally rise there together; they are large, white, and hairy within.

Culture of the MITCHELLA.

It is propagated by seeds, which should be sown on a bed of the following compost; mix two parts garden-mould and one of pond-mud: make a bed of this in the nursery, and in spring sow the seeds on it. When the plants come up they should be thinned if they rise too close, and carefully weeded and watered till they are of a size to transplant: they may then be planted out in the garden in sheltered places, and they will flower in their full natural perfection.

MOLY, a species of *Allium*, and propagated in the same manner as *Garlick*. See the article **GARLICK**.

MONARDA, a genus of plants that has no English name, ranged by Linnæus among the *diandria monogynia*, and of which there are five species. 1. *Monarda*, with headed flowers, the stamina of which are almost in two bodies, and an acute, angular stalk, commonly called *Oswego Tea*. 2. *Monarda*, with heads of flowers terminating the stalks, which have obtuse angles. 3. *Monarda*, with headed flowers, and the leaves smooth and serrated. 4. *Monarda*, with flowers growing in whorls, the petals of which are spotted. 5. *Monarda*, with flowers growing in whorls, and the corolla longer than the involucre.

The first species is a native of Pennsylvania and New-York. The root is composed of many fibres connected to an oblong head. The stalk is square, thick, firm, upright, rising two feet high: the angles are sharp, and the colour is a pale green, often tinged with brown or red. The leaves are placed in pairs, and have short foot-stalks: they are broad, sharp-pointed, deeply serrated at the edges, and of a dark green. The flowers naturally terminate the stalk in a large beautiful scarlet head: but often there rises another head supported on a slight stalk, which takes its origin from the centre of the first, and is a kind of continuation of the main stem. The flowers are very numerous and elegant: they are long, tubulated, gaping, and in colour of a bright scarlet. The cup is formed of one piece, tubular, striated, and cut into five equal segments at the edge.

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One petal forms the flower, it rises from the cup with a long tube, and is at the extremity split as it were into two lips; the upper lip is long, narrow, undivided, and all the way of equal breadth: the lower lip is broader, it turns down, and is cut into three segments, of which the two side ones are small and obtuse, and the middle one longer, narrower, and nipped at the end.

The second species is a native of Canada. The stalks are hairy, have obtuse angles, and rise three feet high. The leaves are oblong, hairy, broad at their base, but end in acute points, a little indented on their edges, and placed by pairs. The stalks and branches are terminated by heads of elegant purple flowers.

The third species greatly resembles the second, only the leaves are smoother, and the flowers are almost white.

The fourth species is a native of Virginia. It rises with square stalks about two feet high, these branch out from bottom to top. The leaves are spear-shaped, and slightly indented on their edges. The flowers are situated in whorls near the top of the stalk: they are large, and their colour is yellow, spotted with purple.

The fifth species is very like the fourth, only the flowers are not spotted.

Culture of the MONARDA.

The first, second, and third species are propagated by seeds, which should be sown the beginning of September on a bed of fresh earth. When the young plants come up they must be thinned and kept clear from weeds: toward the end of May they may be taken up with a ball of earth, and planted where they are to remain; they will require frequent waterings, and should be allowed a foot and a half distance from each other, or from other plants, and they will thus flower in full perfection.

The fourth and fifth species are also propagated by seeds, which, if sown on a border of light earth exposed to the east, the plants will rise freely; when they are fit to remove they may be transplanted into a shady border, in the same manner as directed for the first sort: and if they should shoot up stalks to flower, they should be cut down to strengthen the roots, that they may put out lateral buds, for when they are permitted to flower the first year, the roots seldom live through the winter. In the autumn the plants may be removed, and planted in the open borders of the pleasure-garden, where they will flower the following summer: and if the season should prove dry, they should be duly watered, otherwise they will not be near so beautiful.

MONEYWORT, a species of *Loose-strife*. See the article **LOOSE-STRIFE**.

MONKSWOOD. See the article **ACONITE**.

MOONSEED, *Menispermum*, a genus of plants, of which there are three species. 1. Moonseed, with a navel-shaped leaf. 2. Moonseed, with an ivy-leaf. 3. Moonseed, with heart-shaped leaves, which are hairy on their under side.

The first species is a native of North America. It has a thick, ligneous root, from which are sent out many climbing stalks, which become ligneous, and rise to the height of twelve or fourteen feet, twisting themselves about the neighbouring plants for support. The leaves are large, smooth, and roundish: their foot-stalks are placed almost in the middle of them; on the upper side there is a hollow in that part of the leaf, resembling a navel. The flowers come out in loose bunches from the sides of the stalks: they are of an herbaceous colour, small, and composed of six oblong, oval petals, and six very short stamina, terminated by single summits; the three germen situated in the center, turn to so many channelled berries, each containing one compressed seed.

The second species differs from the first in the shape of its leaves, which are angular: their foot-stalks join to the base of the leaves, so have no umbilical mark on their surface. The stalks of this become ligneous, and raise as high as those of the first sort: the flowers and berries do not differ from them.

The third species is a native of Carolina: this differs from the second sort in its roots not becoming woody as those

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those do. The stalks are also herbaceous; the leaves are entire and hairy, not so large as those of the second, nor is the plant so hardy.

Culture of the MOONSEED.

The first species is easily propagated by laying down of the branches, which if performed in autumn, they will have made good roots by that time twelvemonth, when they may be separated from the old plant, and transplanted where they are designed to remain; these plants require support, for their branches are slender and weak. If these are planted near trees in wilderness quarters, where their stalks may have support, they will thrive better than in an open situation.

The second species is propagated in the same manner as the first.

The third species is propagated by parting of the roots: the best time for doing this is in the spring, a little before the plants begin to shoot; these should be planted in a warm situation and a light soil close to a wall exposed to the south or west: their stalks must be fastened up to prevent their trailing upon the ground: in this situation the plants will sometimes flower, and by being sheltered in severe frosts, their stalks may be preserved from injury.

MOONWORT. See the article **SATTIN-FLOWER.**

MORINA, a genus of plants that has no English name, and of which there is only one species.

It is a native of Persia. The root is taper, running deep into the ground, sending out several thick, strong fibres. The stalk rises near three feet high: it is smooth, of a purplish colour towards the bottom, but hairy and green towards the top. The leaves are prickly, of a lucid green on their upper side, armed on their edges with spines. The flowers come out from the wings of the leaves on each side of the stalk: these have very long tubes, which are slender at the bottom, but are enlarged upwards, and are a little incurved; the brim opens with two large lips, the upper lip is indented at the top and rounded, the lower lip is cut into three obtuse segments; under the upper lip are situated two bristly stamina, which are crooked, and crowned with yellow summits. The flowers appear in July, some of them are white, and others of a purplish red on the same plant.

Culture of the MORINA.

This plant is propagated by seeds, which it never ripens here, so must be obtained from the place where it is native; these should be sown in autumn in the place where the plants are to remain, for they send forth tap roots, which run very deep into the ground, and when these are broken or injured in transplanting, the plants seldom thrive after; they may be sown in open beds or borders of fresh light earth, being careful to mark the places that the ground may not be disturbed; for it frequently happens that the seeds do not come up the first year when they are sown in autumn: but when they are sown in the spring, they never come up till the year following. The ground where the seeds are sown must be kept clean from weeds, which is all the care they require till the plants come up; where they are too close together, they should be thinned so as to leave them near eighteen inches apart. In the spring, just before the plants put out new leaves, stir the ground gently between them, and lay a little fresh earth over the surface of the bed to encourage them.

Red MOECCO, a species of Bird's, or Pheasant's-eye. See the article **PHEASANT'S-EYE.**

MOSCHATEL, **HOLLOW-ROOT**, or **MUSK-CROW-FOOT**, *Adoxa*, a genus of plants, ranged by Linnæus among the *diandria tetragynia*, of which there is only one species.

This plant grows naturally in the woods of England, and most other countries in Europe. The leaves and flowers smell strongly of musk.

Culture of the MOSCHATEL.

It is propagated by parting the roots in autumn, which should always be planted in the shade of trees or shrubs, and they require no other culture than being watered and kept clear from weeds.

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MOTHERWORT, a species of Lion's-tail. See the article **LION'S-TAIL.**

Moth MULLEIN, a species of the Mullein. See the article **MULLEIN.**

MOULD, a loose kind of earth, every where obvious on the surface of the ground, called also natural or mother-earth: by some also loam. The goodness of a mould, for the purposes of gardening, &c. may be known, according to Miller, by the sight, smell, and touch. 1. Those moulds that are of a light chestnut or hazelly colour, are counted the best: of this colour are the best loams, and also the best natural earth, and this will be the better yet, if it cut like butter, and does not stick obstinately, but is short, tolerably light, breaking into small clods, is sweet, will be tempered without crusting or chopping in dry weather, or turning to mortar in wet. Next to that the dark grey and russet moulds are counted the best, but the light and dark ash-colour the worst, such as is usually found on common heathy ground; the clear tawny is by no means to be approved, but that of a yellowish red colour is the worst of all: this is commonly found in wild and waste parts of the country, and for the most part produces nothing but goss, furze, and fern, according as their bottoms are more or less of a light and sandy, or of a spewy, gravel, or clayey nature. 2. All lands that are good and wholesome, will after rain, or breaking up by the spade, emit a good smell. 3. By the touch we may discover whether it consists of substance entirely arenaceous or clammy: or, as it is expressed by Mr. Evelyn, whether it be tender, fatty, detestive, or slippery: or more harsh, gritty, porous, or friable.

MULBERRY-TREE, *Morus*, a genus of plants, ranged by Linnæus among the *monoecia tetrandria*: of which there are seven species, but three of these only are cultivated in English gardens; viz. 1. Mulberry, with oblique, smooth, heart-shaped leaves; or the Mulberry with a white fruit. 2. Mulberry, with rough, heart-shaped leaves, being the Mulberry with a black fruit; or the common Mulberry. 3. Mulberry, with hand-shaped leaves, and prickly fruit.

The first species is a native of China; the second sort grows wild in Italy, near the sea-coasts; and the third is a native of Japan and China.

The first species, or the white Mulberry-tree is commonly planted for its leaves to feed silk-worms in France, Italy, &c. though the Persians always make use of the common black Mulberry for that purpose. The trees which are designed to feed silk-worms, should never be suffered to grow tall, but rather kept in a sort of hedge, and instead of pulling off the leaves singly, they should be sheered off together with their young branches.

The second species is common in most gardens, being planted for the delicacy of its fruit.

Culture of the MULBERRY-TREE.

The first species may be propagated either from seeds or layers, but the most expeditious way of raising it in any great quantity, is from seeds procured from the south of France or Italy. The best method of sowing these seeds in England, is to make a moderate hot-bed, which should be arched over with hoops, and covered with mats: upon this bed the seeds should be sown the middle of March, and covered over with light earth, about a quarter of an inch deep. In very dry weather the bed should be frequently watered, and in the heat of the day shaded with mats, and also covered in cold nights.

The second species may be propagated by sowing the seeds, or by laying down the tender branches, which in two years will take root, and may then be transplanted to the places where they are to remain. Those plants which are propagated from seeds, are commonly the most vigorous, and generally make the straightest stems: but then there is a very great hazard of their being fruitful, for it often happens that those plants for the most part are of the male kind, which produce katkins, but seldom have much fruit: but as the trees raised by layers are subject to have crooked stems, there should be care taken in the choice of straight shoots to make layers, and when they are transplanted out, they should have straight

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stalks fixed down by each, to which they should be fastened as the shoot is extended, until it comes to the height you design the stem: then you may suffer the branches to extend as they seem inclinable, for this tree should not be often pruned, but only such branches should be taken off which shoot cross and bruise themselves by cutting against each other, and such as decay should be cut off. This tree delights in a light soil, not too wet nor over dry, and should have an open exposure. The soil under this tree should also be every year well dug and manured, though there will scarce any sort of plants grow under it.

The third species may be propagated by laying down the branches, or planting the cuttings, and may be managed as was directed for the second species.

MULLEIN, *Verbascum*, a genus of plants, ranged by Linnæus among the *pentandria monogynia*, of which there are nine species. 1. Mullein, with running leaves, which are woolly on both sides, called Hig-taper, or Cows-lungwort. 2. Mullein, with oblong, wedge-shaped leaves. 3. Mullein, with heart-shaped, oblong leaves, growing on foot-stalks. 4. Mullein, with oblong, smooth leaves, embracing the stalks, and single foot-stalks to the flowers; or white Moth Mullein. 5. Mullein, with lyre-shaped, winged leaves. 6. Mullein, with the lower leaves oblong, sinuated, woolly, and waved, and those on the stalks heart-shaped, embracing the stalks with their base, and almost naked. 7. Mullein, with naked, oval, crenated, lower leaves, and an almost naked branching stalk; or purple Moth Mullein. 8. Mullein, with naked, cut leaves, a leafy stalk, woolly cups, and two flowers to the foot-stalks. 9. Mullein, with woolly, linear leaves, and a naked stalk.

The first, second, and third species grow naturally in this country, and all the rest in different parts of Europe.

Culture of the MULLEIN.

The six first species are propagated by seeds, which should be sown in August, on a bed of light earth, in an open situation; the plants will come up in September, and the February following they should be transplanted to the places in which they are to remain, at the distance of two feet asunder. If their seeds are permitted to scatter they will come up without any farther care.

The seventh species is propagated by off-sets; which should be taken off in autumn, and planted time enough to get good root before winter, on an east border, where they may have the morning sun, and in a sandy loam.

The eighth and ninth species are also propagated by off-sets, which should be taken off in autumn, and planted in small pots filled with light, sandy earth, and placed in a shady situation.

MULTISILIQUOUS PLANTS, those which have, after each flower, many distinct, long slender siliquæ, or pods, in which their seeds are contained; such as bear's-foot, columbine, houseleek, navelwort, orpine, &c.

MUMMY, among gardeners, a kind of wax used in grafting and planting the roots of trees, made in the following manner: Take one pound of black pitch, and a quarter of a pound of turpentine; put them together into an earthen pot, and set them on fire in the open air, holding something in your hand to cover and quench the mixture in time, which is to be alternately lighted and quenched, till all nitrous and volatile parts be evaporated. To this a little common wax is to be added; and the composition is then to be set by for use.

Dr. Agricola directs its being used in planting pieces of the roots of trees, in the following manner: Melt it, and having let it cool a little, dig in the two ends of the pieces of root, one after another; then put them in water, and plant them in the earth, the small end downwards, so that the larger may appear a little way out of the earth, in order to have the benefit of the air; then press the earth hard down about them, that they may not receive too much wet. This work he recommends in the months of September, October, and November.

MUNTINGIA, a genus of plants that has no English name, and of which there are three pieces. 1. Munting-

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gia with heart spear-shaped leaves, ending in acute points, woolly on their under side, and foot-stalks having one flower. 2. Muntingia with rough spear-shaped leaves, having three veins, and flowers growing in clusters from the wings of the stalk. 3. Muntingia with oblong, oval, acute, rough leaves, and flowers having foot-stalks.

These plants are all natives of the West Indies, where the first species rises to the height of thirty feet. The leaves are placed alternate on the branches; they are slightly sawed on their edges, and of a lucid green. The flowers are white, and in shape resemble those of the bramble.

The second species seldom exceeds the height of fourteen feet. The leaves are spear-shaped, rough, and reflexed on their edges. The flowers, which are small and white, rise from the bosoms of the leaves in clusters.

The third species rises about fifteen feet high. The leaves are rough, a little hairy, and of a yellow green. The flowers grow in clusters on the sides of the branches; these are small, and of a yellow colour.

Culture of the MUNTINGIA.

These plants are propagated by seeds, which should be sown in pots filled with light rich earth, and plunged into a moderate hot-bed of tanners bark, where they may remain till Michaelmas, when they should be removed into the stove, and set in the bark-bed. During the winter season the pots should now and then be watered when the earth appears very dry. In the beginning of March the pots should be removed out of the stove, and placed in a fresh bark-bed under frames, which will bring up the plants soon after. When they are about two inches high they should be carefully taken out of the pots, and each planted in a separate small pot filled with the earth before directed, and then plunged into the hot-bed again, where they must be shaded till they have taken new root; after which they should be constantly watered. In autumn when the nights begin to be cold the plants must be removed into the stove and plunged into the bark-bed.

It will be proper while these plants are young to keep them in the stove all the year, allowing them a large share of air in warm weather, but as they advance in strength they will be more hardy; they may then be more exposed in summer, and in winter will live in a dry stone, if kept in a moderate degree of heat.

MUSHROOMS, *Fungi*. These are by many supposed to be produced from the putrefaction of the dung in which they are found; but notwithstanding this notion is pretty generally received among the unthinking part of mankind, yet, by the curious naturalists, they are esteemed real plants; for they have a regular root, a stalk consisting of several arrangements of fibres, the interstices of which are filled up with a parenchymatous substance, leading from the root to the head or umbel, the under-side of which is full of lamellæ or chives, every one of which is a regular pod or seed-vessel. If these lamellæ are examined in their several states, the seeds in them may be easily discovered, and are always found to be of a size and degree of maturity proportioned to the state of the plant: they have each of them also a siliquaceous aperture lengthways, the seeds lying in rows ready to fall through it. The plant is easily and regularly propagated through these, and may not only be raised from seed, but, like many other plants, may be propagated by roots; the several filaments at the root producing tubercles, in the manner of the potatoe; from each of which there will arise new roots, and a new plant. Hence, like other vegetables, they are annually propagated by the gardeners near London for sale. We shall therefore describe the method of cultivating them; but as there are several unwholesome sorts, we shall first give a short description of the true eatable kinds. These at first appear of a roundish, like a button, the upper part of which, as also the stalk, is very white: but being opened, the under part is of a livid flesh colour, but the fleshy part, when broken, is very white; when these are suffered to remain undisturbed, they will grow to a large size, and explicate themselves almost to a flatness, and the red part underneath will change to a dark colour.

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Culture of MUSHROOMS.

These are propagated by off-sets, and if you have no beds of your own that produce these plants, you should look abroad in rich pastures, during the months of August and September, till you find them; and then opening the ground about their roots, you will often find the earth full of small white knobs, which are off-sets from the Mushrooms: these should be carefully gathered, and preserved dry with the earth about them. The Mushroom-beds should be made of dung in which there is good store of litter. These beds should be made on dry ground, and the dung being laid upon the surface about a foot thick, two feet and a half broad, and of a length in proportion to the quantity of mushrooms desired, it should be covered about four inches deep with strong earth; upon this lay more dung, about ten inches thick; then another layer of earth; still drawing in the sides of the bed, so as to form it like the ridge of an house, which may be done by three layers of dung, and as many of earth. When the bed is finished, it should be covered with litter, to keep out the wet, and prevent its drying; in this situation it may remain eight or ten days, by which time it will be of a proper degree of warmth; the litter should then be taken off, the sides of the bed smoothed, and a covering of light rich earth should be laid over the bed; upon this the small roots or off-sets of the Mushrooms should be put, placing them two or three inches asunder; then gently cover them about half an inch thick with the same light earth; and again put on the covering of litter. The great skill in managing these beds, is that of keeping them in a proper temperature of moisture. By this means Mushrooms may be produced all the year; and when the beds are destroyed, the surface which contains the dust and roots of the Mushrooms, should be laid by in a dry place for a fresh supply, till the proper time of using it.

MUSK, a species of *Hibiscus*. See the article *HIBISCUS*.

MUSK, or GRAPE-HYACINTH, *Muscari*, according to Linnæus a species of Hyacinth, but by other botanists considered as a distinct genus, of which there are several species; all of them perennial plants, and very hardy.

Culture of the MUSK-HYACINTH.

These plants are propagated by off-sets. In June, when the leaves of these plants are decayed, the roots should be taken up, and spread upon mats in a dry place for a fortnight, till the bulbs are dried; then they may be packed up, each sort by itself, till October, when they are to be planted in borders for flowering the following spring.

They should never be suffered to remain in the ground more than two years unremoved, for they multiply so fast, that the number of off-sets greatly weakens the flowering roots, and the flowers are consequently small.

MUSK-CROWFOOT. See the article *MOSCHATEL*.

MUSTARD, *Sinapis*, a genus of plants ranged by Linnæus among the *tetradymia siliquosa*, and of which there are five species. 1. Mustard with many angled, rough, swelling pods, and a longer beak. 2. Mustard with prickly pods, and a very long, oblique beak, commonly called White Mustard. 3. Mustard with a smooth, four-cornered pod, or common Mustard. 4. Mustard with bundled branches, and the upper leaves spear-shaped, and entire. 5. Mustard with double-winged leaves, and linear segments. All these species are annual plants, the first grows naturally on arable lands in many parts of England, and is a common weed in several other places in Europe; it is never cultivated in gardens.

The second species is a native of Switzerland, England, and France, and is commonly known by the name of the White or Garden-Mustard; it is always sown for a salad herb in spring.

The third species is the common Mustard, which grows naturally in this country, and many other parts of Europe: it is cultivated in many places both in gardens and fields for its seeds.

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The fourth species is a native of Asia, and the fifth of Spain, but neither of these are ever admitted into the gardens.

Culture of the MUSTARD.

The seeds of the second species must be sown very thick in drills, on a warm border or a moderate hot-bed; and they will be fit to cut for fallading in three weeks after the sowing.

The third species is propagated by seeds, which should be sown in spring upon an open place, which has been well dug or ploughed. When the young plants come up, they must be cleared of weeds, and hoed up to about eight or ten inches asunder; they will thus grow strong, and when the seeds are ripe, the whole plant must be cut down, and the seeds threshed out for use.

MYAGRUM, a genus of plants of which there are five species. 1. Myagrum with oval pods, having foot-stalks; commonly called Gold of Pleasure. 2. Myagrum with heart-shaped pods standing upon foot-stalks, having many seeds and indented leaves. 3. Myagrum with globular, compressed, small pods. 4. Myagrum with short pods, and the outer leaves sinuated and indented. 5. Myagrum with small heart-shaped pods, and leaves embracing the stalk. For the first species, see the article *GOLD OF PLEASURE*.

All the rest are annual plants, and natives of different parts of Europe.

Culture of the MYAGRUM.

If the seeds of all these species are permitted to scatter in the autumn, the plants will rise without any care, and only require to be thinned, and kept clean from weeds.

MYRTLE, *Myrtus*, a genus of plants ranged by Linnæus among the *icofandria monogynia*, of which there are eight species; the following varieties of these are commonly cultivated in our gardens.

Two sorts of Nutmeg-myrtles, one with a narrower leaf than the other: the striped broad-leaved Myrtle, the striped upright Myrtle, the Bird's-nest Myrtle, the striped Box-leaved Myrtle, the striped Nutmeg-Myrtle, and the striped Rosemary-leaved Myrtle.

Culture of the MYRTLE.

These plants may all be propagated by cuttings, the best season for which is the beginning of July, when choice should be made of some of the straightest and the most vigorous shoots, which must be about six or eight inches long; and the leaves on the lower part stripped off about two or three inches high, and that part twisted which is to be placed in the ground; then let some pots be filled with light rich earth, and plant the cuttings therein, at about two inches distance from each other, observing to close the earth fast about them, and give them a gentle watering to settle it to the cuttings; then place the pots under a common hot-bed frame, and plunge them into some old dung, which will prevent the earth from drying too fast; they must be carefully shaded in the heat of the day, and air allowed them in proportion to the warmth of the season, observing to water them every two or three days. In about a month's time the cuttings will be rooted, and begin to shoot, when they must by degrees be inured to the open air, into which they should be removed toward the latter end of August, and placed in a warm situation; where they may remain till the end of October, and then be removed into a greenhouse, and must be placed in the coolest part of it, that they may have air given them, when the weather is mild.

The spring following these plants should be taken out of the pots very carefully, preserving a ball of earth to the roots of each of them, and they should be placed into separate small pots filled with light rich earth, and place them under a frame until they have taken root; after which they should be inured to the open air, and in May they must be placed abroad for the summer, in a sheltered situation, where they may be defended from stormy winds. During the summer season, they will require to be plentifully watered, especially those in small pots, which in that season soon dry; you must therefore observe to place them where they should receive the morning

ing sun; for when they are too much exposed in the heat of the day, the moisture contained in the earth of these small pots will soon be exhaled, and the plants greatly retarded in their growth.

In August following you should shift them into pots a size larger, filling them up with the same rich earth, and be careful to trim the roots which were matted to the side of the pots, as also to loosen the earth from the outside of the ball, some of which should be taken off, that the roots may the easier find a passage into the fresh earth: then you must water them well, and at this time you may trim the plants, in order to reduce them to a regular figure; such of them as are inclinable to make crooked stems, you should thrust down a slender, strait stick, to which their stems should be fastened so as to bring them upright.

As these plants advance in stature, they should annually be removed into larger pots, according to the size of their roots: but you must be careful not to put them into pots too large, which will cause them to shoot weak, and many times prove the destruction of them; therefore when they are taken out of the former pots, the earth about their roots should be pared off, and that within-side the ball must be gently loosened, that the roots may not be closely confined, and then place them into the same pots again, provided they are not too small, filling up the sides and bottom of them with fresh rich earth, and giving them plenty of water to settle the earth to their roots, which should be frequently repeated, for they require to be often watered both in winter and summer, but in hot weather they must have it in plenty.

The best season for shifting these plants is either in April or August, for if it is done much sooner in the spring, the plants are then in a slow growing state, and so not capable to strike out fresh roots again very soon: and if it is done later in autumn, the cold weather coming on will prevent their taking root.

In October, when the nights begin to be frosty, you should remove the plants into the green-house: but if the weather proves favourable in autumn, they may remain abroad until the beginning of November: for if they are carried into the green-house too soon, and the autumn should prove warm, they will make fresh shoots at that season, which will be weak, and often grow mouldy in winter, if the weather should be so severe as to require the windows to be kept close shut, whereby they will be greatly defaced, for which reason they should always be kept as long abroad as the season will permit, and removed out again in the spring, before they begin to shoot out: and during the winter season that they are in the green-house, they should have as much free air as possible when the weather is mild.

Candleberry MYRTLE, a species of *Myrica*.

This plant is a native of North America. It rises with several strong shrubby stalks to the height of eight feet. The leaves are stiff, spear-shaped, of a yellowish green on their upper side, and paler on their under. The flowers grow in katkins, and the female ones are succeeded by small roundish berries covered with a kind of meal.

Culture of the Candleberry MYRTLE.

It is propagated by seeds, which must be sown in autumn, and the plants will come up the following spring. They must be carefully watered in dry weather, and screened from frosts while young, which is all the care they require, for when they have obtained strength, they will resist the cold of this country very well in the open air.

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NAPÆA, a genus of plants which has no English name: there are only two species of it. 1. *Napæa*, with angular foot-stalks and rough leaves. 2. *Napæa*,

with leaves having three acute-pointed lobes, and naked foot-stalks.

These plants are natives of different parts of North America. The first species rises to the height of eight feet. The leaves are rough, hairy, deeply cut into six or seven lobes, which are irregularly indented on their edges: these diminish in their size towards the top, where they have seldom more than three lobes. The flowers grow towards the top of the stalk, and are of a white colour. The stalks of the second species rise four feet high. The leaves are smooth, deeply cut into three lobes, which end in acute points, and are irregularly sawed on their edges. The foot-stalk of the flower is placed at the base of the leaf, this is three inches long, and divides at the top into three small stalks, each sustaining one white flower.

Culture of the NAPÆA.

These plants are easily propagated by seeds, which should be sown on a bed of common earth in the spring. When the plants come up they only require to be kept clean from weeds till autumn, when they may be transplanted into the places where they are to remain. They succeed best in a rich moist soil.

NARCISSUS, *Daffodil*, a genus of plants, ranged by Linnæus among the *hexandria monogynia*: of which there are six species. 1. *Narcissus*, with one flower in a sheath, and the limb of the nectarium very short and rotated. 2. *Narcissus*, with one flower in a sheath, the limb of the nectarium bell-shaped, erect, and equal with the petals. 3. *Narcissus*, with one flower in a sheath, with a very large turbinated nectarium, and declined stamina. 4. *Narcissus*, with one flower in a sheath, and with a very short nectarium, which is cut into six parts. 5. *Narcissus*, with many flowers in a sheath, a short, bell-shaped nectarium, and awl-shaped leaves. 6. *Narcissus*, with many flowers in a sheath, with a bell-shaped nectarium, and plain leaves.

These are all perennial plants, and of each species there are many varieties: among these the nine following are extremely beautiful, the culture of which will be found proper for that of all the rest. 1. *Fringed Narcissus*. 2. *Golden Narcissus*. 3. *Gold-cupped Narcissus*. 4. *Great Orange Narcissus*. 5. *Double Lemon Narcissus*. 6. *Double oriental Narcissus*. 7. *Great White Narcissus*. 8. *Poetic Narcissus*. 9. *Silver and Gold Narcissus*.

Fringed NARCISSUS. This plant is extremely valuable on account of the season in which it flowers, for with right management it will annually rear its head among the snow in the severest winter, and add to the small number of flowers at that season.

The root is a small bulb. The leaves are very long, of a moderate breadth, and a fine green: the stalk rises in the midst of these a foot in height, tolerably firm, and of a pale green. On its top stands a single flower, so heavy that it droops; this rises from within a plain, oblong scabbard, which, when it has performed the office of shielding the bud, droops and withers. The flower is large, and its colour a fine yellow: it is composed of a nectarium and six petals; the nectarium rises hollow from its base, and spreads to the rim; the petals are six in number, and they are inserted into the nectarium on the outside, a little above the base. The nectarium is naturally divided at its edge into twelve segments, which are jagged at their sides, and of a pointed form: these the luxuriance of culture will divide more deeply, in a curled manner, and edge the rim of this part with a perfect fringe. The seed-vessel is roundish but ridged, and the seeds are numerous and round.

Culture of this NARCISSUS.

The best method of propagating this plant is by offsets, which it produces in great abundance; these should be planted in a bed of fresh pasture-earth, with a very little cow-dung well mixed among it. When the plants come up, all the care they will require is being kept clear from weeds.

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Golden NARCISSUS. This is a very elegant plant. The root is large, roundish, and furnished from the base with many thick, coarse fibres. The leaves are usually four: they are long, of moderate breadth; their colour is a blueish green, and they have some substance. The stalk is robust, round, naked, and a foot and half high, purplish at the bottom, and green towards the top: it has no leaves, but at the summit is placed a scabbard, serving as a general cup or defence for many flowers; this bursts when they are ready to appear, and becomes yellowish. The flowers rise together from the head of the stalk in the bottom of this scabbard, ten, twelve, or more in number; together they make a large tuft, and they are separately of a considerable size: each rises naked from the stalk, and is composed of a nectarium and six petals. The colour is, in the whole, yellow, but with a great variation: the petals are of a delicate pale yellow, and the nectarium is deeper; this is very conspicuous, though much shorter than the flower: it is formed in the manner of a bell, with an even rim, and stands out a little from the insertion of the petals; these are six in number, and they are inserted at some distance below the edge of the nectarium, in a regular expanded manner. From the flower rise six filaments: they are terminated by oblong buttons. The style is single, longer than these, and crowned with a three-parted stigma. The fruit is a roundish seed-vessel, formed of three parts, lightly marked with three ridges, and contains many seeds in three cells, with a columnar receptacle.

Culture of this NARCISSUS.

It is propagated either by seeds or by parting of the roots: if by seeds great care should be taken to save them from a good flower, and they must be sown the first week in September in some one of the light rich composts, and let where they can have free air and the morning sun. In winter the boxes must be removed into a southern aspect, and towards April be taken back into their first place again; in spring the leaves will appear, they must be kept clear from weeds, and sometimes gently watered. Early towards autumn they will fade, and a quarter of an inch of the same compost must be then sifted over them.

They must never throughout the year be kept with the mould too wet, nor crumbly through over dryness, and the third year they should be separated from the earth by sifting, and planted out in a place sheltered from winds, and not open to the full sun. The first week in August is the best time for this: the bed must be kept clean from weeds, and five weeks after they must have a fresh covering of an inch of the same compost. In this bed they will flower, and there will be a mixture of extreme fine ones and some more common, but there will be very few bad flowers; they should be marked when in bloom, and the succeeding August the roots of an inferior kind should be taken up and planted in other parts of the garden, leaving the fine ones in the bed at a foot distance, where they must remain till the fourth year. They will thus blow every season fairer than the last, and once in three years afterwards will yield many off-sets.

Those who chuse to raise them from off-sets, should take such as have been with the parent root three years in the ground; these should be taken off in August, and planted at ten inches distance. When the plants come up they may be treated in the manner already directed for the seedlings.

Gold-cupped NARCISSUS. The root is roundish, full of a slimy juice, and hung with many fibres. The leaves are long and of a pale green, at first they are hollowed, but when they have stood some time they spread out flat, and grow yet paler. The stalk is a foot and half high, naked edged, and of a deeper green; on its summit stands a single flower: this is very large, and of considerable beauty; it bursts out sideways from a pale green scabbard, which is before this opening, oblong, compressed, and blunt at the end: this serves it as a cup, and withers soon after the full blowing. The body of the flower is formed of six large petals, oblong, broad,

of an oval form, and of a nectarium which equals them in length: this is folded and rumpled at the sides, and at the extremity expanded in form of a bell, with a waved, irregular, and sinuated rim. The colour of the flower is yellow, the petals are of a pale but very pleasing tinct, and the nectarium is of a deep gold yellow.

Culture of this NARCISSUS.

It may be propagated by off-sets, or raised from seeds. The best method is to purchase Dutch roots, raised from the true kind by off-sets in their gardens, and from the best produce of these to collect seeds for a fresh progeny. The first year let them flower, and cut down the stalks before they form the seeds: then when the leaves are withered take them up, dig out the mould, and fill the place with a light rich compost: plant in the roots again at fourteen inches distance, and keep the surface clear from weeds. The succeeding spring these roots will flower much stronger than the first. The finest flowers are those which have the strongest stalk, the largest flower, and the nectarium most folded, curled, and waved, and of the highest gold colour; the seeds should be saved from these with care, and in the beginning of spring sown in boxes of the same compost used for the roots; till October they must have the morning sun only, from that time to March they must be set open to the noon sun, and during summer they must be placed so as to have only the morning sun again. The earth when too dry must be gently watered, and moss and weeds cleared off with care; after two years the roots must be taken out of this mould, and planted at four inches distance in a bed of the same compost. When they flower there will be found a great variety among them, many will be inferior to those from which the seeds were saved, and many much finer. The ordinary kinds may be planted out in different parts of the garden, and the finest in a bed by themselves.

Great Orange NARCISSUS. This is an elegant variety of the former sort. The root is a large bulb, and from its base sends many long, thick fibres. The leaves are long, narrow, flat, pointed, and edged, and of a pale greyish green. The stalk is a foot high, and supports a single flower: this bursts from an obtuse, filmy scabbard, and is very large and extremely conspicuous. The colour throughout is a strong yellow, and, when the flower is perfect, there is in it a tinge of orange.

Culture of this NARCISSUS.

This Narcissus is propagated in the same manner as the preceding one: nor is its culture in any thing different, except that it requires a mellowed soil, enriched with rotted dung, and about the time of its flowering wants more water.

Double Lemon NARCISSUS. The root of this plant is a bulb, somewhat oval in form, full of a slimy, whitish juice, and furnished at the base with many fibres. The leaves are numerous, long, moderately broad, obtuse, and generally brown at the end, sometimes also tinged with that colour along the edges, and elsewhere of a pale green. The stalk is flatted and edged, striated, of a pale green, and a foot high. On its top is placed one large flower, which droops a little, and is of a delicate lemon yellow. The segments are long, obtuse, waved at the edges, and disposed in a wild and irregular manner. The smell is slight but not agreeable.

Culture of this NARCISSUS.

It is propagated by off-sets from the roots, and these are to be treated in the manner already directed for the Gold-cupped Narcissus.

Double Oriental NARCISSUS. This plant has a roundish root, large, and covered with a tough, brown skin: three or four leaves rise from it, long, narrow, flat, or very little hollowed, of a blueish but agreeable green, and of a firm substance. The stalk is round, firm, upright, and fourteen inches high. At its top stands a very noble cluster of flowers, six or more: each has its separate foot-stalk an inch and a half in length, and these all rise together from the head of the stalk, where they are originally inclosed with their flowers, in a green, flat scabbard. The flowers are large and

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elegant ; their colour is a mixture of white, a faint, and a deeper yellow. These are disposed in various degrees and shadows ; and in different flowers with a great deal of elegant variety. Sometimes there is very little of the white, and often none ; but in that case the variety of yellows is still pleasing ; the deepest colouring being in the middle, and the colour growing paler from thence outwards.

Culture of the NARCISSUS.

The following compost must be prepared for this plant.

Mix a barrow of fine mould from an upland pasture, with a bushel of wood-pile earth ; a peck of sand, two quarts of sea-water, or, in want of that, of brine ; and a quarter of a peck of sheep's dung.

In this sow the seeds or propagate the parted roots in the manner directed for the other sorts.

Great White NARCISSUS. This is a very elegant and noble flower, hardy enough to bear the worst seasons with us. The root is roundish, covered with a brown outer skin, and hung with many large and long white fibres from the base. The leaves are broad, eight inches long, obtuse, and of a pale green, with a tinge of bluish. The stalk is fifteen inches high, pale and erect. The flowers burst together from the top of it, where they are at first inclosed in a slight scabbard ; and each has its separate long foot-stalk. They are large and elegant ; the petals oblong, expanded, and of a pure white ; and the nectarium small, and lightly tinged with yellow : it is waved at the edge, and the yellow is in different flowers variously disposed, and in different degrees of strength ; but in the most delicate state it is pale.

Culture of this NARCISSUS.

The plant is a native of the southern parts of Europe, and of the East : it flourishes naturally in a deep rich soil, where there is some shade and moisture. It has been much improved from the wild state in our gardens ; and we have been long accustomed to receive the roots from Holland. This plant is usually raised from off-sets ; but the best method of producing it is from seeds, for the flowers from the off-sets are limited to the few original kinds ; and they will degenerate even from the full beauty of these after a certain time. On the other hand, those raised from seeds, will have the choice of innumerable variations in the colouring of the cup, and fullness of the petals. The best of which may be preserved in beds raised for that purpose ; and the others planted out in common borders, will add greatly to their beauty. In both cases the management is to be the same with that we have directed for the other kinds.

Poetic NARCISSUS. The root is a roundish bulb, hung at the base with many long fibres. They are long, moderately broad, and of a pale green. The stalk is naked, hollow, flatted a little, and edged ; and at its top supports a single and very elegant flower : this naturally droops a little, it is formed of six petals, with a nectarium of a rounded form, short and waved at the edge. The petals are snow-white ; but in the center of the flower there is an elegant crown of red, with a fringed edge ; beneath this a white, and beneath that again a yellow circle.

Culture of this NARCISSUS.

The culture of this species is the same with the other kinds, only that there should be an addition of marle to the compost ; if that cannot be had, a mixture of pond-mud and cow-dung must be used in its place ; and when this has been exposed to the winter's frosts, it must be added to the rest.

The seeds must be saved from those plants which have the red circle finest in the flower, and a second time from the finest of those which have been produced from such original sowing. Thus the flower will attain its greatest perfection ; and if some of the roots be annually planted later than the others, and in a place not much exposed to the sun, there will be a continuation of the flowers a long time in beauty. The roots must be allowed a fresh bed of compost every year.

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Silver and Gold NARCISSUS. The root is roundish, composed of many coats, and full of viscid juice. The leaves are numerous, long, narrow, obtuse, and of a pale blueish green. The stalk is upright, a foot high, somewhat flatted, edged, and hollow, and it bends at the top with the weight of one flower : this bursts from an oblong, leafy scabbard, and is composed of six petals, and a very large cup. The petals are of a very delicate shining silvery grey, and the cup yellow. This is the natural colouring, but sometimes the yellow runs in light variegations among the grey, and often the grey in the same manner spreads itself among the yellow ; either way the colouring is extremely singular and beautiful. The cup, which is very large, is double and divided also in various manners ; sometimes the body is entire, and sometimes the whole is cut and divided down to the bottom.

Culture of this NARCISSUS.

This is a variety from some of the large single Narcissus's, which, when once obtained, must be increased by off-sets. These should be taken off every year when the roots are taken up, and new compost must always be allowed. The old root will by this be kept vigorous, and will flower in its full beauty many years ; and the off-sets, as they will be too small to blow at first, must be planted in a nursery-bed at four inches distance to gather strength, and afterwards removed into the garden.

Autumnal NARCISSUS, a species of *Amaryllis*. See the article *AMARYLLIS*.

NAVELWORT, *Cotyledon*, a genus of plants ranged by Linnæus among the *decandria pentagynia*, and of which there are six species. 1. Navelwort with roundish, plane, intire leaves. 2. Navelwort with semiglobular leaves. 3. Navelwort with oval crenated leaves, and a spiked stalk. 4. Navelwort with oblong pointed leaves ending with a spine, and a spiked stalk. 5. Navelwort with hooded leaves sharply indented, and growing alternate, and a branching stalk with erect flowers. 6. Navelwort with cut leaves, and four pointed flowers.

The first and second species are shrubby plants, and natives of the Cape of Good Hope. They flower in the months of July and August, but never ripen seeds in this country.

The third species is a biennial plant, and grows naturally in Crete and Siberia. The fourth is also a native of Siberia.

The fifth species grows upon old walls and other buildings in many parts of England and Portugal, and is seldom cultivated in gardens.

The sixth species is a native of Egypt. It is a shrubby plant, and requires a warm stove to preserve it through the winter in this country ; nor should it be exposed abroad in summer, but kept in the stove, or placed in an airy glass case.

Culture of the NAWELWORT.

The first and second species are propagated by cuttings, which may be planted during any of the summer months ; but the cuttings should be laid in a dry place, for a week or more before they are planted, that the wound may heal over.

The proper compost for these plants is one third light fresh earth from a pasture, one third sand, and the other third part lime rubbish, and rotten tan, in equal quantities. These must be well mixed, and laid in a heap six or eight months before it is wanted, turning it over five or six times, that the parts may the better incorporate ; and before it is used it will be proper to pass it through a screen.

Fill as many small pots with this compost as you have cuttings, and place one in the center of each pot, about two inches deep, or more, according to their strength, then give them a gentle watering, and set the pots in a warm shady place for about a week, after which they should be plunged into a moderate hot-bed of tanners-bark, observing to give them air by raising the glasses as often as the weather will permit, and shading them in the heat of the day.

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In about a month after planting, these cuttings will have taken root, and then they should by degrees be exposed to the open air; first drawing the pots out of the tan, and setting them on the top; then raising the glasses very high in the day-time; in about a week after rooting, they may be removed into the green-house, and there stand to harden for another week; after which they may be placed in the open air in a well defended situation, taking care not to have them too much exposed to the sun, till they have been inured to the air for some time. In this place the plants may remain till the beginning of October, at which time they should be removed into the green-house, where they must be placed near the windows, and allowed as much free air as the season will permit; giving them very little water. In winter they should be placed in a moderate stove, and not set abroad till midsummer.

The third species is propagated by seeds, which if sown on a wall will thrive better than in the ground, so that where the seeds scatter themselves in such situations, the plants thrive better than when they are cultivated.

The fourth species is propagated by off-sets; and when the plants come up, they only require to be kept clear from weeds. They succeed best in a shady situation.

If the seeds of the fifth species are permitted to scatter upon old walls, and other buildings, they will thrive much better than when sown in the ground.

The sixth species is propagated by cuttings, which in summer should be planted in small pots, and plunged into a moderate hot-bed; when they have taken root they must be removed into the stove, where they are always to remain. They should have but little water, especially in winter.

Venus NAVELWORT, a species of Hound's Tongue. See the article HOUND'S TONGUE.

NAVEW. See the article RAPE-SEED.

NECTARINE, a species of the Peach-Tree. See the article PEACH-TREE.

NECTARIUM, expresses what is sometimes a part of the corolla; and sometimes, though rarely, the whole. It is a part destined for the reception of the honey-juice of the plant, and is very various in its figure. Sometimes it is only a hollow in a petal; sometimes it is a little squama; sometimes a tubercle, and sometimes a plain tube.

Adam's NEEDLE. See the article ADAM'S-NEEDLE.

NEP, or CAT-MINT. See the article CAT-MINT.

NEPENTHES, a genus of plants ranged by Linnæus among the *gynandria tetrandria*, of which there is only one species.

This plant is a native of the East Indies. It has a thick brown root, furnished with many fibres of a reddish colour. The stem is two feet high, round and firm, and is in many parts tinged with a faint purple. The leaves have no foot stalks: they are oblong, moderately broad, highly ribbed, and furnished each with a kind of vessel at its extremity. The leaf itself, which is narrow at the base, grows broader toward the middle, and thence decreases gradually; but where it might be expected to terminate, the long point is continued in a sort of horn. This hangs down for a considerable length, swelling very gradually in thickness, and from this lowest part turns up again, expanding into a hollow vessel, three inches long, and half an inch in diameter, terminating in a large opening, which is covered with a kind of lid, all of one piece, and ending in a narrow, slender tail. This vessel is filled with a clear well-tasted water: its colour is at first a whitish green, afterwards it becomes yellow, and at last purplish. The little piece falls over it very close while small, but when it is of the full bigness, and replete with the water, it gapes, and in the end the weight of the liquor bears down the vessel, it runs out, and then the part fades.

The flowers terminate the stalk in considerable numbers: they are placed on short foot-stalks, and their colour, when in perfection, is of a faint yellow or green; sometimes they are of a pale red, and at others whitish. The cup, for there are no petals, is formed of a single

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piece, which is divided deeply into four oval segments; these stand wide expanded, and resemble so many petals by their colouring as well as form. In the centre rises a short style, terminated by an obtuse top; and upon its summit are placed four filaments, so very short, that they are only distinguished by their buttons. The seed-vessel is columnar, oblong, angulated, and marked by four ridges. These shew the joinings of four valves, of which it is composed, and it opens in four places. The seeds are numerous and light.

Culture of the NEPENTHES.

It is propagated by seeds, which should be procured from Ceylon, or other places where the plant is native, and sown in pots filled with the following compost. A quantity of rich garden-mould, with one third part from under a wood-pile, a little marle, and as much harsh-sand: a quart of each of these last ingredients will be enough for a bushel of the whole.

Set the pots up to the rim in a bark-bed of moderate heat, and refresh the mould when dry with a gentle watering. When the young plants appear water them gently and frequently: pull up the weakest, and leave only four or five in each pot; here let them get some strength, then fill some more pots with the same compost, and set one of the plants upright in each. Plunge the pots up to the rim in a bark-bed, and shade them with mats drawn over the glasses till they are well rooted: after which let them have a little air in the middle of mild days: and when they have stood about three weeks in this place, place them in the stove, where they must always remain.

NERVES, are tough, long strings, which run either across or lengthways, in the leaves of a plant.

NETTLE, *Urtica*, a genus of plants, ranged by Linnæus among the *monoecia tetrandria*: of which he distinguishes twelve species, most of them common weeds in this country: and as the rest are seldom preserved, except for the sake of variety, it will only be necessary to mention the one species which is commonly kept in our gardens; viz. Nettle, with opposite leaves, and the fruit bearing amenta globose, commonly called the Roman Nettle.

It is an annual plant, and grows naturally in several parts of Europe.

Culture of the NETTLE.

There are two varieties of this plant, which may be easily propagated by sowing the seeds in March upon a bed of light earth. When the plants are come up they should be transplanted to the places in which they are designed to remain, after which they will require no other care but to be kept clear from weeds; and if they are permitted to shed their seeds, they will grow without further culture.

Dead NETTLE, or ARCHANGEL, *Lamium*, a genus of plants, of which there are several species, some of them are common weeds in this country, others are only admitted into botanic gardens for the sake of variety, and the two following are the only ones cultivated in other gardens; viz. 1. Eastern Dead Nettle. 2. Mountain Dead Nettle, with a balm leaf.

The first species grows naturally in the Archipelago. The stalks rise eight or nine inches high. The leaves are smooth, heart-shaped, and spotted with white, which make a very pretty appearance during winter. The flowers are white, and grow in whorls round the stalks; they appear in April, and the seeds ripen in June.

The second species is a native of Portugal. It rises with a strong, square, erect stalk, a foot and a half high. The leaves are large, heart-shaped, veined, and deeply sawed on their edges. The flowers are very large, of a deep purple colour, and grow in whorls round the stalks at every joint. Those on the lower part of the stalk appear the beginning of May, they are succeeded by others above, so that there is a continuance of flowers upon the same stalk for near two months.

Culture of the Dead NETTLE.

If the first species is permitted to scatter its seeds the plants will come up in autumn, and thrive better than when sown by hand: they only require to be kept clear from

from weeds. The second species is propagated by parting of the roots: the proper time for this is in October, but they must not be transplanted oftener than every third year, if they are required to flower strongly, for the great beauty of this plant consists in the number of its stalks, which are always proportional to the size of the roots, for small ones will put out one or two stalks only, whereas the large ones will have eight or ten. These plants thrive best in a soft, loamy soil.

Shrubby Hedge NETTLE, *Prasium*, a genus of plants, of which there are only two species. 1. Shrubby Hedge Nettle, with oval leaves, which are indented on every side. 2. Shrubby Hedge Nettle, with oblong, oval, sawed leaves.

The first species is a native of Sicily, and the second of Spain and Italy.

Culture of the Shrubby Hedge NETTLE.

These plants may be propagated either by cuttings, or from seeds: if they are propagated by cuttings they should be planted on a shady border towards the end of April. When they are well rooted they may be transplanted into the places where they are to remain, or into pots, that they may be sheltered in winter under a common frame, where they may be protected from the frost, and have as much free air as possible in mild weather.

The cuttings should be taken from plants which have been exposed to the open air, whose shoots are short and strong; and if a joint of the former year's wood is cut to each of them, they will more certainly succeed.

If these plants are propagated by seeds, they should be sown on a bed of light earth in April. In May the plants will come up, when they require no other care than that of keeping them clean from weeds, and in the autumn following they may be transplanted in the manner already directed for those raised from cuttings.

NETTLE-TREE. See the article **LOTE-FREE.**

NIGHT-SHADE, *Solanum*, a genus of plants, ranged by Linnæus among the *pentandria monogynia*: of which most botanists enumerate a vast number of species, but the above writer has reduced them to the twenty-three following. 1. Night-shade, with a shrubby, unarmed stalk, oval, hairy, entire leaves, and compound umbels. 2. Night-shade, with a shrubby, unarmed stalk, oval, entire leaves, and thread-like foot-stalks to the flowers, proceeding from the sides of the branches. 3. Night-shade, with a shrubby, unarmed stalk, spear-shaped leaves, turning inward, and umbels sitting close to the stalks. 4. Night-shade, with a shrubby, unarmed stalk, leaves growing in pairs, one of which is bigger than the other, and cymose flowers. 5. Night-shade, with a shrubby, bended, and unarmed stalk, the upper leaves spear-shaped, and bunches of flowers at the top of the stalk, commonly called Bitter-sweet. 6. Night-shade, with a shrubby, bended, and unarmed stalk, oblong, sinuated leaves, at the sides of the stalk, and bunches of flowers at the top of the stalk. 7. Night-shade, with a shrubby, almost unarmed stalk, and wedge-shaped, sinuated leaves, turning backward. 8. Night-shade, with an herbaceous, unarmed stalk, and entire, winged leaves. 9. Night-shade, with an unarmed, herbaceous stalk, cut, winged leaves, and single bunches of flowers, or Pomum amoris. 10. Night-shade, with an herbaceous, unarmed stalk, cut, winged leaves, bunches of reflexed flowers divided into two parts, and hairy berries. 11. Night-shade, with an herbaceous, unarmed stalk, and heart-shaped leaves, turning inward. 12. Night-shade, with an unarmed, herbaceous stalk, oval, indented, angular leaves, and nodding umbels; or the common Night-shade of the shops, with a black fruit. 13. Night-shade, with an unarmed, herbaceous stalk, oval, hairy, intire leaves, and prickly cups; or the Melongena, Mad-apple, or Egg-plant. 14. Night-shade, with a prickly, herbaceous stalk, heart-shaped, sinuated leaves, and prickly cups. 15. Night-shade, with a prickly, herbaceous stalk, and heart-shaped leaves with five lobes, hairy, and prickly on both sides, commonly called Batchelor's Pear. 16. Night-shade, with a prickly, herbaceous

stalk, winged leaves, sinuated, obtuse segments, and prickly cups. 17. Night-shade, with a prickly, shrubby stalk, angular, woolly, intire leaves, prickly on both sides, and unarmed cups. 18. Night-shade, with a prickly, shrubby stalk, spear-shaped, angular leaves, prickly on both sides, and loose bunches of flowers. 19. Night-shade, with recurved thorns on the stalks, and sinuated leaves, downy on their under-side, prickly on both sides, and the foot-stalks of the flowers prickly. 20. Night-shade, with a prickly, shrubby stalk, leaves turned inside, and prickly cups. 21. Night-shade, with a prickly, shrubby stalk, heart-shaped, hairy leaves, turned in at the brim, and unarmed cups. 22. Night-shade, with a prickly, shrubby stalk, and spear-shaped, angular, indented leaves. 23. Night-shade, with a prickly, shrubby stalk, smooth, obtuse, unarmed leaves, with three lobes.

These plants are natives of Europe, Asia, Africa, and America, but most of them grow naturally in America.

Culture of the NIGHT-SHADE.

The first, second, eighth, ninth, tenth, and eleventh species are propagated by cuttings, which when planted must be closely covered with a bell or hand-glass, and shaded from the sun till they have taken root, after which they should be treated in the manner of other tender exotics. They require a stove in winter, and must not be exposed abroad above ten or twelve weeks in the warmest part of the summer.

The third, fourth, fifteenth, and sixteenth species are propagated by seeds, which should be sown upon a pot of rich earth in the spring, and plunged into a moderate hot-bed, observing to water them constantly. When the plants are come up they should be planted in a gentle hot-bed, covered with rich earth, about six inches deep, allowing them six inches distance every way; the bed must be arched over with hoops, and covered with mats. The plants must be frequently watered, and when they have acquired strength, and the season becomes favourable, let them be inured by degrees to bear the open air, to which they should be fully exposed in June: then let them be taken up with a ball of earth to the root of each plant, and placed separately in pots filled with rich earth; these pots must be placed in a shady situation, and must be frequently watered till the plants have taken new root, after which they may be removed to a more open exposure, and placed among other exotic plants. In dry weather they must have frequent waterings, and in winter they should be removed into the green-house, where in mild weather they must have as much free air as possible.

The fifteenth and sixteenth species are annual plants, but the plants of the third and fourth should be shifted about the end of April, annually, and their roots pared round, cutting off all the mouldy fibres: then plant them each into a pot filled with fresh, rich earth.

The fifth species is easily propagated by laying down the branches, or planting cuttings in the spring, upon a moist soil, where they will soon take root, and may be afterwards removed to the places where they are designed to remain.

The sixth and seventh species are propagated by cuttings, which should be planted in a shady border during any of the summer months. After they have taken root, let them be planted each in a separate pot, which must be placed in the shade till the plants have taken new root, and in winter removed to the green-house.

The other species are all propagated by sowing their seeds early in the spring upon a good hot-bed. When the plants are come up, they should be transplanted each into a separate small pot, filled with light rich earth, and plunged into a fresh hot-bed, till they have taken new root, after which they may be treated like the first species.

American NIGHT-SHADE, *Phytolacca*, a genus of plants, ranged by Linnæus among the *decandria decagynia*, and of which there are only two species. 1. American Night-shade, with entire leaves. 2. American Night-shade, with sawed leaves.

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The first species grows naturally in Virginia, and Mexico; and the second is a native of Malabar.

Culture of the American NIGHT-SHADE.

These species are both propagated by seeds, which should be sown in spring upon a moderate hot-bed. When the plants come up, they should be transplanted on another hot-bed to bring them forward, observing to shade them from the sun till they have taken new root; after which they should be treated as tender exotic plants; and in July transplanted into a warm border, or into pots filled with light earth. When they have taken root, let them be moderately watered, and kept clean from weeds, which is all the care they require.

Climbing NIGHT SHADE, Basella, a genus of plants of which there are only two species. 1. Climbing Nightshade with heart shaped leaves. 2. Climbing Nightshade with oblong blunt leaves.

These plants are natives of the East Indies. They climb to a considerable height, and require support; and should therefore be trained up to a trellis, or fastened to the back of the stove, where their stalks and leaves, which are of a deep purple colour, will make a very handsome appearance.

Culture of the Climbing NIGHT-SHADE.

These plants are propagated by seeds, which should be sown on a hot-bed in the spring; and when the plants are fit to remove, they should be each planted into a separate pot, and plunged into a moderate hot-bed of tanners-bark, where they must be treated in the same manner as other tender exotics.

They may also be propagated by cuttings, which should be planted in pots, and plunged into a moderate hot-bed of tanners-bark, where they will take root in a fortnight or three weeks, when they should be treated in the same manner as the seedling plants.

Deadly NIGHT-SHADE, Atropa, a genus of plants ranged by Linnæus among the *pentandria monogynia*, and of which there are three species. 1. Deadly Nightshade with an herbaceous stalk, and oval intire leaves, or the common Deadly Nightshade. 2. Deadly Nightshade with sinuated, angular leaves, and close acute-angled cups. 3. Deadly Nightshade with a shrubby stalk.

The first species is a native of England, and Austria, but is seldom admitted into gardens on account of its poisonous quality.

The second species grows naturally in Peru, and the third in Spain.

Culture of the Deadly NIGHTSHADE.

The second species is propagated by seeds, which should be sown in pots filled with light earth, and plunged into the bark-bed of the stove, where they must always remain.

The third species is also propagated by seeds, which must be sown in the spring upon a very moderate hot-bed. When the plants will bear to be removed, let them be planted each in a separate small pot filled with loamy earth, and shaded till they have taken root; after which they may be placed with other hardy exotic plants in a sheltered situation, and in October removed into the green-house.

NONE-SO-PRETTY, a species of Saxifrage. See the article **SAXIFRAGE**.

NONE-SUCH, a species of the *Lychnis*. See the article **LYCHNIS**.

NORTHERN ASPECT, is the least favourable of any in England for bringing fruit to perfection. The only trees proper for this situation are the morello cherries; the duke cherries, and some sorts of summer pears. Red and white currants may also succeed; and it will be a means of having a supply of that fruit, after those which are exposed to the sun are gone.

NOSE-BLEED, Achillea. See the article **ACHILLEA**.

NOVEMBER, the eleventh month of the year.

In the *Flower-garden*, if the weather be mild, continue about the beginning of this month, to work upon the ground, and prepare and manage the more hardy plants; when it is more severe, defend the tenderer kinds by

sheltering them with mats, straw, or other covering: In the very bad weather, clean seeds, and prepare tools and instruments for a better season. If the weather continues mild, clear the ground, and finish the autumnal plantations. Break the surface of borders, and rake them afresh, even where they appear already clean, to destroy the moss that spreads over them. Plant perennial flowers where they are wanted. Some of the *Campanulas* may yet be planted safely, also the hardier of the *Monkhood* kind, and the *Pionies*, the tall *Speedwells*, the *Doronicum*, the *Tansier*, *Fumitory*, and some others. Plant also flowering shrubs in favourable soils. There are some few plants which will keep their flowers throughout this month, in the open air; these must be taken great care of. Let the gravel be often rolled, and the ground lightly raked over the naked beds, till the time of the plants shooting. Look over, and cherish the plants, which continue yet with some flowers on them. Toward the end of the month, let the gardener prepare his several composts. If the weather is tolerably mild, look to such parts of the garden as are planted with clumps of shrubs, or any other where there are shrubs or small trees. Go through the ground, to prune and set right those in any part where it may have been omitted at an earlier season, or where some accident may have rendered it needful now. Then clear the ground, raking off the rubbish, and cutting down the decayed stalks of plants. Dig up the ground between the shrubs, and when the earth is well broken, take off the dead leaves, and draw some mould about the roots.

In the *seminary*, finish the business of transplanting the beginning of this month. See that the stakes are secure which support the new-planted trees. Scatter some pease-haulm about their roots, and press it down by stones. Let the ground intended for the spring-plantation be thrown up in ridges. Let it be dug deep; and once a month, for the whole winter, when the weather permits, let it be broke again, and exposed with a new surface. The growth of the nursery are to be protected from the frosts in the same manner as the product of the flower-garden, though in a different degree. The beds of seedling shrubs, or of perennial flowers of a tender nature, must be defended from the ensuing rains and frosts, by hoops and mats, or cloths: but let care be taken, in the mean time, not to make them too tender; let the hoops that defend the beds stand high, and the mats never be drawn over them but in very bad weather, and even at the worst, let them have some air, at those hours when it is well warmed by the sun. This is the practice for those seedlings that have some height, and it may be used also to cuttings of the tenderest kinds that are set in this part of the ground. For those beds in which the plants are but shooting, or have very little height, the best defence is a covering of long dry straw, which must be taken off again when the weather is better. Clear the weeds from the beds of seedling flowers, which were not ready for removal the last season. Then taking advantage of a mild day, the surface must be raked over, and the whole being levelled, some very rich and well-mellowed dung from a melon-bed must be scattered thinly over. Let the gardener look after his seed-beds of the larger kind; if the earth cracks, let him scatter a little more mould, and lay over it some light covering; he must also keep his traps baited for vermin.

In the *Fruit-garden*, the first thing to be done this month is to gather the grapes properly, which is the first step towards their preservation; the ripeness of the grapes is known by their clearness on the bunch, as well as by their softness and mellow flavour. If it happens in any favourable season that the latter kinds ripen thoroughly before the frosts, they must be then cut for preserving. Quinces and medlars will now require to be cleared from the trees, and a proper method considered for preserving them. Continue pruning with due care and assiduity; and the last sort of grapes having been now gathered, the vines should be pruned. The gardener is now to go over the young branches, with a careful hand, and to pick off all the late fruit. After this,

this, if the frosts set in severe towards the end of the month, let a good quantity of old pease-straw be hung upon the tree, so thick as to shelter the young wood, but not so close as to shut out the air. Clear, refresh, and enrich the straw-berry beds. Let the alleys between the beds be dug up a full spit deep, and the mould well broken. Look to the standard apple-trees, whether dwarfs in the garden, or planted in the orchard. Moss must be cleared off their stems: if two branches cross or crowd one another at the extremities, let one of them be taken off, or thinned in that part. If on any part there be loose pieces of decayed bark, let them be taken away, and the place clean wiped. Wherever there is a piece of the bark rotten, let it be cut away to the quick, and wherever a large branch is cut off, the place must be so contrived that wet cannot lodge upon it: if cut with a saw it must be pared even with a chissel, and made to slope downwards. Very old boughs should always be taken from apple-trees. Let the ground be well weeded, and as often as occasion requires enriched with manure or tillage. Go round the new-planted trees, and see that all remain secure, and scatter a little haulm, or some other covering upon the earth, about the bottom of the stems.

In the *Kitchen-garden*. The cauliflower-plants and lettuces, preserved from frost by glasses, must not be buried from the air, which should be admitted in warm and serene days, from eleven o'clock till four; and when the weather is more severe, let the glasses be raised a little at the sides to admit the free air, about the warmest time of the day. If the frosts come on, scatter a little long dry straw over the beds of young radishes. That part of the kitchen-ground which is to be sown in spring, should have the joint assistance of tillage and manure. Take the advantage of a dry day, and open a few trenches in some sheltered part of the ground for pease. Plant more beans. Go over the ground where the forward crops of these two kinds were planted, break the earth between the rows, and draw it up about the stalks. The roots which will be required for the service of the table, should now be taken up and preserved. Let the gardener take care that the reed fences are secure as well as the outer fences. Hot-beds must be kept up in a moderate temper, and as plants are apt to grow mouldy in them, let the glasses be opened as often as possible in the middle of the day, since the want of air is the occasion of mouldiness in the plants. Look over the seeds which will be required in the spring, and perfectly clean them; look over the tools, repair, and put them in good order.

NURSERY, or SEMINARY, is a piece of land set apart for raising and propagating all sorts of trees and plants, to supply the garden and other plantations.

In a nursery of fruit-trees, the following rules are to be observed.

First, that the soil should not be better than that in which the trees are to be planted out for good.

Secondly, that it ought to be fresh, and not such as has been already worn out by trees, or other large growing plants.

Thirdly, it ought neither to be too wet nor too dry, but of a middling nature; though of the two extremes dry is to be preferred, because, though trees in such a soil do not make so great a progress, yet they are generally sounder, and more disposed to fruitfulness.

Fourthly, it must be inclosed in such a manner that neither cattle nor vermin may come in: and so as particularly to exclude hares and rabbits, which, when the ground is covered with snow, are great destroyers of young trees.

Fifthly, the ground being inclosed should be carefully trenched about two feet deep: this must be done in August, that it may be ready for receiving young stocks at the season for planting, which is generally about the beginning of October; in trenching the ground great care must be taken to cleanse it from the roots of all noxious weeds.

Sixthly, the season being come for planting, level down the trenches as equal as possible, and then lay out

the ground into quarters, which may be laid out in beds for a seminary, in which you may sow the seeds or stones of fruit.

Seventhly, provide yourself with stocks, and the next year proceed to transplant them in the following manner: draw a line across the ground intended to be planted, and open a number of trenches exactly straight: then take the stocks out of the seed-beds, in doing which, you should raise the ground with a spade, in order to preserve the roots as entire as possible; prune off the very small fibres, and if there are any that have a tendency to root directly downwards, such roots should be shortened. Then plant them in the trenches, if they are designed for standards, in rows four feet from each other, and a foot and a half distant in the rows; but if for dwarfs, three feet row from row, and one foot in the row will be a sufficient distance. These plants should by no means be headed or pruned at top, which will weaken them, and cause them to produce lateral branches. If the winter should prove very cold, lay some mulch on the surface of the ground near their roots, taking care not to let it lie too thick near the stems of the plants, and to remove it as soon as the frost is over. In the summer season destroy the weeds, and dig up the ground every spring between the rows. The second year after planting, such of the stocks as are designed for standards, should be suffered to grow five or six feet high before they are budded or grafted; for the manner of doing which, see the article INOCULATION and GRAFTING.

As to timber-trees Mr. Miller advises those gentlemen who would have plantations in parks, woods, &c. to make nurseries upon the ground intended for planting, where a sufficient number of the trees may be left standing after the others have been drawn out to plant in other places.

The ground intended for the flower-nursery should be well situated to the sun, and defended from strong winds by plantations of trees or buildings. The soil also should be light and dry, especially for bulbous-rooted flowers; for in this nursery the off-sets of all bulbous-rooted flowers should be planted, and remain there till they become blowing roots, when they should be removed into the pleasure-garden, and planted either in beds or borders, according to the goodness of the flowers. These flowers may also be raised in the nursery from seeds. The seedling auriculas, polyanthus, ranunculuses, anemonies, carnations, &c. should be raised in this nursery, where they should be preserved till they have flowered, when all those should be marked that are worthy of being transplanted into the flower-garden; this should be done in their proper seasons: for all these seedling flowers ought not indiscriminately to be exposed to public view in the pleasure-garden, because it always happens that there are great numbers of ordinary flowers produced among them, which will make there but an indifferent appearance.

NUT, *Nux*, a seed inclosed with an osseous epidermis, or hard, bony outerskin, commonly called the shell.

NUT-TREE, or HAZEL. See the article HAZEL.

Bladder NUT, *Staphylea*, a genus of plants, ranged by Linnæus among the *pentandria trigynia*: of which there are only two species. 1. Bladder Nut, with pinnated leaves; or the common wild Bladder Nut. 2. Bladder Nut, with trifoliate leaves.

The first species grows naturally in woods in several parts of England, but is cultivated as a flowering shrub in the nursery-gardens. This has several shrubby stalks arising from the same root, which grow ten or twelve feet high, covered with a smooth bark, and divided into several branches, which are pithy. The leaves are winged, composed of two pair of oval lobes, terminated by an odd one; these differ greatly in size according to the strength and vigour of the shrub. They are smooth, entire, and of a light green colour, standing upon long foot-stalks; the flowers grow upon long, slender foot-stalks, which hang downward; these spring from the wings of the stalk near their extremities, and are disposed in oblong bunches; they have each five oblong white petals, which expand in form of a rose; these are succeeded

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succeeded by inflated capsules or bladders composed of three cells, one or two of which has a roundish smooth, hard seed, and the other are barren.

The second species is a native of North America. It has a more substantial stalk than the first; the bark of the older branches and stalks is smooth, and of a grey colour; that of the young is of a light green, and very smooth; the leaves are by threes on each foot-stalk; the lobes are oval, ending in a point, and their edges are sawed; they are of different sizes, according to the age and strength of the plants; they are smooth, and of a light green colour. The flowers grow from the sides of the branches, in longer bunches than those of the former sort, but their foot-stalks are much shorter; the flowers are of a cleaner white, and their petals are larger, as are also the bladder capsules; the seeds are larger, and ripen better than those of the common sort.

Culture of the Bladder-Nut.

Both these species are usually propagated by suckers from the root, which the first sort sends out in great plenty; these should be taken from the old plants in autumn, and their roots trimmed, then planted in a nursery, in rows at three feet distance, and one asunder in the rows. In this nursery the plants should stand one or two years, according to their strength, and then be transplanted to the place where they are to remain. The plants which are propagated in this manner, are very subject to put out suckers in greater plenty from their roots, than those which are raised from seeds, or propagated by layers or cuttings, so are not to be chosen when the others can be had. If they are propagated by layers, the young branches should be laid down in autumn, in the same manner as is practised for other trees and shrubs; these will have put out roots the following autumn, when they may be taken from the old plants, and planted in a nursery, where they may grow one or two years to get strength, and then be removed to the places where they are to stand. When they are propagated by cuttings, it should be the shoots of the former year, and if they have a small piece of the two years wood at the bottom, there will be more certainty of their succeeding; for as the young shoots are soft and pithy, they are very subject to rot, when they have no part of the old wood to them. They must be planted in autumn on a shady border, but must not have too much wet.

They may also be propagated by sowing their seeds early in the autumn, in beds of light fresh earth; and when the plants are come up, they must be carefully kept clear from weeds, and in very dry weather they should be refreshed with water; in these beds they may remain till the October following, at which time they should be carefully taken up, and planted in a nursery, placing them in rows three feet asunder, and the plants one foot distant in the rows; and, if the following spring should prove very dry, it will be necessary to give them a little water, to encourage their taking root; after which they will require no farther care, but to keep the ground clear from weeds, and every spring to prune off irregular branches, and dig the ground between the rows, to loosen the earth, that their roots may the more easily extend. In this nursery they should remain two years, by which time it will be proper to transplant them out where they are to remain, the best season for doing which is in autumn: when the seeds are sown in the spring, the plants seldom come up till the following year.

Malabar NUT, a species of *Justicia*. See the article *JUSTICIA*.

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OAK-TREE, *Quercus*, a genus of plants ranged by Linnæus among the *monoecia polyandria*, and of which he distinguishes fourteen species, and among

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them are the *Ilex*, or ever-green Oak, and the *Suber* or Cork-tree, two distinct genera according to former botanists.

As all the species of this genus are propagated in the same manner, it would be needless to describe their specific differences.

Culture of the OAK-TREE.

All the sorts of oaks are propagated by sowing their acorns: and the sooner they are put into the ground after they are ripe, the better they will succeed; the proper season therefore is the beginning of November, by which time they will be fallen from the trees. The manner of sowing the acorns, if designed for a small plantation, or to be removed, is to prepare some beds of fresh earth, neither too strong and heavy, nor too light and dry. In these beds you should place the acorns in rows one foot asunder, and about two inches distance in the rows, covering them two inches thick with the same fresh earth, observing to leave none of them uncovered, to entice the vermin, which may in a short time destroy all the seeds.

In the spring when the plants begin to appear, you must carefully clear them from weeds, and if the season proves dry, you should allow them a little water. In these beds the plants should remain till the following autumn, at which time you should prepare a spot of good fresh earth, in size proportionable to the quantity of plants, which should be well trenched and levelled: then towards the middle or latter end of October, you should carefully take up the plants so as not to injure their roots, and plant them out in rows three feet asunder, and eighteen inches distant plant from plant, observing never to suffer the plants to abide long out of the ground, for their roots would dry, and endanger the growth of the plants. When they are planted, you must lay some mulch upon the ground near their roots, to prevent the earth drying too fast; and if the season prove dry, you should refresh them with a little water. When the plants have taken root in this nursery, they will require little more care than to keep them clear from weeds, and to dig the ground between the rows every spring; in doing which you should cut off such roots as extend very far from the trunk of the trees, which will render them better for transplanting again. You should also prune off such side branches as extend themselves very far, and would retard the upright shoots; but you must, by no means, cut off all the small lateral branches, some of which are absolutely necessary to be left on, to detain the sap for the augmentation of the trunk.

When these trees have remained in the nursery three or four years, they will then be large enough to transplant to the places where they are to remain: for it is not proper to let them grow very large before they are planted out: the season for which is in the autumn. When they are planted, the surface of the ground should be mulched about their roots to prevent its drying too fast. You must also stake them to prevent their being shaken and disturbed by the winds, which would retard their rooting. In transplanting these trees, you should by no means cut off their heads; all that must be done is only to cut off any bruised or ill-placed branches: but there can be no greater injury done to these trees than to shorten their shoots, which in that case often decay entirely, or at least down to the next vigorous bud.

The trees thus raised and managed, will, if planted in a proper soil, grow to a considerable magnitude, and are very proper for a wilderness in large gardens, or to plant in clumps in parks, &c. but if they are designed for timber, it is by much the better method to sow the acorns in the place where they are to remain; in order to which, you should provide yourself in autumn with a sufficient quantity of acorns, which should be always taken from straight, upright, vigorous, growing trees. These should be gathered from under the tree as soon as may be after they are fallen, and if possible in a dry time, laying them in some open room to dry, after which they may be put in dry sand, and preserved till the end of November, when you should prepare the ground for planting them.

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Holy OAK, or HOLLYHOCK. See the article HOLLYHOCK.

OAK of Cappadocia, a species of Goose-foot. See the article GOOSE-FOOT.

OAK of Jerusalem, another species of Goose-foot.

OCTOBER, the tenth month of the year.

In the *Flower-garden*. Prepare the borders for making their best shew in the succeeding months of spring. The leaves of many plants which are to flower in spring, will make a pleasing appearance, and give variety in autumn; these should be kept in good order, and the ground between them cleared: whatever dead leaves there be upon them should be taken off, and if any straggle or fall irregularly, they should be retrenched. Let all weeds be taken up, and the ground be raked smooth, where it is good, and refreshed with some rotten dung and pond-mud, where it is exhausted. Let such flowers as yet retain their beauty be taken care of; draw up the earth about their stems, pick off decayed leaves, water them daily, and stir the earth at a distance round their roots. Keep the gravel clear of weeds, and when there is wet let it be well rolled. Where there is box wanting in the edgings let it be planted. The gardener must observe whether the distances at which his perennial roots are planted, will admit of any thing between them, and by what additions he may best give variety and fullness. Look to the pots of auriculas, if there be any dead leaves, pick them off; see no weeds or moss rise in the pots: and when all is thus cleared, let them be removed into shelter. Take the same course with the plantations of flowering shrubs, as with the borders. Let the gardener consider whether a new border may be formed, an old one converted to a better use, or in any part of the ground an useful addition made. Visit the beds of seedlings, for a succession of bulbous-rooted flowers: clear them from weeds, and defend them from frosts; the weeds should be pulled up by hand, and some fine earth then to be sifted over them. Remove suckers from the roots of lilacs. Towards the end of this month prune roses, honeysuckles, and other flowering shrubs. Defend the seedlings in boxes from the cold winds, and give them all the advantage that they can have from the sun.

In the *Seminary*. Many things will require to be planted about the middle of this month, and the ground must now be got ready for them. Stocks should now be planted for grafting and budding. Secure trees newly planted from rocking with the wind by firm stakes, to which the trees should be tied with a hay-band, or other soft substance. Round the stems of new-planted trees scatter a parcel of old woollen rags, torn into small pieces: over these sprinkle some good dung, and secure the whole by some brick-bats to prevent its being carried off by the wind. Many trees are now to be raised in the seminary, for the wilderness plantation.

In the *Fruit-garden*, prune gooseberry and currant-trees. About the beginning of this month the same kind of management is to be continued to the raspberry-ground. Prune also apricots and nectarines. Let the winter-fruit be gathered for preservation. Prune peach-trees about the end of this month.

In the *Kitchen-garden*, the Battersea cabbages will be fit for planting at proper distances, where they are to stand, about the beginning of October. The hot-beds must now be made. The beds of mint and balm must be enriched for making a good appearance in spring. A parcel of cauliflower-plants should be planted out for winter. The seedling asparagus-beds must be protected from the frost. Earth up celery about the end of this month. Raise young fallading upon hot-beds under good shelter. Some purple and scarlet radishes should now be sown in places well sheltered; and put into the ground a small crop of beans and pease.

The *Green-house* plants must be removed into their shelter as the danger of cold approaches. Chuse a dry day for bringing in tenderest kinds, cleaning their stems, their branches, and the tubs and pots in which they are planted. Let a mixture of cow-dung and coal-ashes be well wrought together, and sprinkled over the surface of

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the earth in the pots and tubs. The hardier kinds, as they bear the air longer, so when housed they require more of it: they must therefore through the winter, have as much as can safely be given them; they should now and then have a little water, and they must be cleaned as well as the others.

There are a number of *Stove* plants which bear the summer out of doors, and thrive the better for it, but can by no means endure the first colds of our winter; these are to be removed out of the open air, on the first chillness: they should not however be taken at once out of the open air into the stove, but first removed into the green-house, and about ten days after into the stove, when they should be carefully looked over, that no decayed leaves remain upon them.

OLDENLANDIA, a genus of plants which has no English name, and there is only one species of it.

It is a native of the West-Indies, and a low plant with many branches spreading upon the ground. The leaves are long, narrow, and placed opposite. The flower-stalk is about an inch long, and divides into three or four smaller foot-stalks, each sustaining one small white flower.

Culture of the OLDENLANDIA.

The seeds of this plant should be sown early in the spring on a hot-bed, and when the plants are come up they should be transplanted on another hot-bed, or into small pots, and plunged into a moderate hot-bed of tanners-bark, observing to water and shade them till they have taken root, after which time they must have a large share of air in warm weather, and be frequently watered. With this management the plants will flower in June, and their seeds will ripen soon after, which should be gathered from time to time as they ripen; for as the branches grow larger, so there will be fresh flowers produced till autumn, when the plants will perish; but if the seeds are permitted to scatter in the pots, the plants will soon after appear, which will live through the winter, provided they are placed in the stove, and will flower early the following spring.

OLEANDER, or ROSE-BAY, *Nerium*, a genus of plants, ranged by Linnæus among the *pentandria monogynia*, and of which there are only three species. 1. Oleander, with linear, spear-shaped leaves, three at a joint. 2. Oleander, with spear-shaped, ovated leaves, and divaricated branches. 3. Oleander, with oval, acuminate foot-stalks.

The first species grows naturally in Greece: there are two varieties of this, one with white, the other with red flowers.

This rises with several stalks to the height of eight or ten feet. The branches come out by threes round the principal stalks, and has a smooth bark, which in the red flowering is of a purplish colour, but in the white sort has a light green bark. The leaves stand by threes round the stalks, upon very short foot-stalks, and point upwards, of a dark green, very stiff, and end in acute points. The flowers grow at the ends of the branches in large loose bunches, which are in one of a bright purple, or crimson colour, and in the other they are of a dirty white: they have short tubes, which spread open at the top, where they are deeply cut into five obtuse segments, which are twisted at bottom, so are oblique to the tube. This plant flowers in July and August, but the seeds seldom ripen well in this country.

The second species is a native of India; this rises with shrubby stalks six or seven feet high, which are covered with a brown bark. The leaves are stiff, from three to four inches long, and a quarter of an inch broad; they are of a light green, and their edges are reflexed; these are placed sometimes by pairs opposite, at others they are alternate, and sometimes by threes, round the branches. The flowers grow in loose bunches at the ends of the branches; they are of a pale red, and have an agreeable musky scent.

The third species is a native of both Indies; this is a shrubby plant, of six feet in height; the substance of the stem is tender, and its bark is brown. The young branches are green and juicy. The leaves are seven inches

inches long, an inch broad; of a fine green on the upper side, and silvery underneath. The flowers are numerous, very large, and of a glorious purple; they grow in clusters all over the upper part of the branches, and cover the plant with a most elegant colour.

Culture of the OLEANDER.

These plants are propagated by layers, which should be slit at the joint in the same manner as is practised in laying of carnations, which will greatly facilitate their taking root; if these branches are laid down in autumn, and are properly supplied with water, they will have taken root by that time twelvemonth, when they should be carefully raised up with a trowel, and if they have taken good root, they should be cut off from the old plant, and each planted in a separate small pot, filled with soft loamy earth; those of the common sort will require no other care, but to be placed in a shady situation, and gently watered as the season may require, till they have taken new root; but the two other species should be plunged into a very moderate hot-bed, to forward their taking root, observing to shade them from the sun in the heat of the day. After the common sort has taken new root, the plants may be placed in a sheltered situation with other hardy exotics, where they may remain till the end of October, when they should either be removed into the green-house, or placed under a hot-bed frame, where they may be protected from frost in winter, but enjoy the free air at all times, when the weather is mild.

The other two sorts, when they have taken new root, should be gradually inured to bear the open air, into which they should be removed in July, where they may remain till October, provided the weather proves mild; but during this time they should be placed in a sheltered situation; and upon the first approach of frost, they must be removed into shelter, for if their leaves are injured by frost, they will change to a pale yellow, and will not recover their colour till the summer following. These sorts may be preserved in a green-house through the winter, and in May when the flower-buds begin to appear, the plants should be placed in an open glass-case, where they may be defended from the inclemency of the weather; but when the weather is warmer, the air should be admitted to them in great plenty.

OLIVE-TREE, *Olea*, a genus of plants ranged by Linnæus among the *diandria monogynia*, of which there are five species. 1. Olive with linear spear-shaped leaves which are hoary on their under side; commonly called Province-Olive. 2. Olive with spear-shaped leaves, and an egg-shaped fruit; called the Spanish Olive. 3. Olive with spear-shaped, obtuse, rigid leaves, which are hoary on their under side; or the wild Olive. 4. Olive with spear-shaped shining leaves, and taper branches, called African Olive. 5. Olive with oval stiff leaves, sitting close to the branches; common called Box-leaved Olive.

The Olive seldom rises to be a large tree. Here the plants are preserved by way of curiosity, and are placed in winter in the green-house.

Culture of the OLIVE-TREE.

These plants may be propagated by laying down their tender branches, which should remain undisturbed two years; in which time they will have taken root, and may then be taken off from the old plants, and transplanted either into pots filled with fresh light earth, or into the open ground in a warm situation. The best season for transplanting them is in the beginning of April, when you should, if possible, take the opportunity of a moist season; and those which are planted in pots should be placed in a shady part of the green-house till they have taken new root. Those planted in the ground should have mulch laid about their roots, to prevent the earth from drying too fast; and should sometimes be refreshed with water, but too much wet will rot the tender fibres of their roots, and destroy the trees. When the plants have taken fresh root, those in the pots may be exposed to the open air, and treated in the same manner with other hardy exotics; but those in the open air will require the ground to be mulched about their roots,

to prevent the frost from penetrating deep into it; and if the frost should prove very severe, they must be covered with mats, which will greatly defend them; care must be taken not to let the mats remain over them after the frost is past, for by keeping them too close, their leaves and tender branches will turn mouldy for want of free air.

But a more expeditious method of having these trees, is to buy them of the people who bring them over every year from Italy. When you first procure them, the roots should be soaked a day in warm water, and cleaned from the filth they have contracted in their passage, after which they should be planted in pots filled with light fresh earth, and plunged into a moderate hot-bed, observing to screen them from the violence of the sun, and to refresh them with water. With this management they will begin to shoot in five or six weeks after, when air must be allowed them in proportion to the warmth of the season; and after they have made pretty good shoots, they must be inured to bear the open air by degrees, placing them in a situation where they may be defended from strong winds; in this place they may remain till October following, when they should be removed into the green-house. Having thus acquired strong roots, and made tolerable good heads, they may be drawn out of the pots, preserving the earth to their roots, and plant them in the open air in a warm situation, where you must manage them as was before directed for the young ones.

Wild OLIVE, or **OLEASTER**, *Elæagnus*, a genus of plants of which there are three species. 1. Wild Olive, with spear-shaped leaves. 2. Wild Olive without thorns, and narrow spear-shaped leaves. 3. Wild Olive with oval leaves.

The two first species are natives of the **Levant**. The leaves of the first species are not more than two inches long, and about three quarters of an inch broad in the middle; they are of a silver colour, placed alternately; at the foot-stalks of every leaf there come out a pretty long sharp thorn, which thorns are alternately longer: the flowers are small, the inside of the empalement is yellow, and they have a strong scent when open.

The second species has no thorns on the branches, the leaves are more than three inches long, and half an inch broad, and have a shining appearance like satin. The flowers grow out at the foot-stalks of the leaves, sometimes two, and frequently three at the same place; the outside of the empalement is silvery and fluted, the inside of a pale yellow, having a very strong scent.

The third species grows naturally in Ceylon, and in some other parts of India; it rises with a woody stem to the height of eight or nine feet, dividing into many crooked branches. The leaves are oval, and have several irregular spots of a dark colour on their surface; they are placed alternately on the branches, and continue all the year.

Culture of the Wild OLIVE.

These plants may be propagated by laying down the young shoots in autumn, which will take root in a year's time, when they should be cut off from the old trees, and either transplanted into the nursery for two or three years to be trained up, or into the places where they are to remain. The best time for transplanting them is in March, or early in the autumn, provided the roots are mulched, to protect them from severe frost; they must be placed where they can be screened from strong winds, for they are very subject to be split down by the wind if they are too much exposed.

The third species requires a warm stove to preserve it in this country, for it is too tender to live in the open air, excepting in the very warmest part of summer.

ONION, *Cepa*, according to Linnæus a species of the *Allium*, but considered as a distinct genus by other botanists.

The varieties of the common Onion are, the Strasburg Onion, the Spanish Onion, the white Egyptian Onion, the shallot or eschallotes, and several others. Welch Onions are a sort of Onions propagated by gardeners, for the use of the table in spring; they never make any bulb, and are therefore only to be eaten in fallads.

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Culture of the ONION:

The varieties of the Onion are propagated by sowing their seeds the latter end of February, in a dry and somewhat sandy soil, yet rich; in about a month's time the plants will appear, and, in about a fortnight after that, they will be forward enough for hoeing, which must be done with a very small hoe, cutting up all the weeds, and leaving the Onions two inches asunder: this should be done in a dry season, and the ground will then be clear of weeds for a month. At the end of this time they must be hoed again, and cut to three inches apart: and about a month or six weeks after that to four inches, at which distance they will grow very large. Towards the end of July they will have arrived at their full growth, which is known by their leaves hanging down and shriveling, and they must at this time be pulled up and spread on a dry place, and turned every day to prevent their striking fresh roots; in a fortnight or three weeks time they will be dry enough to house, and should be wiped clean, and spread thin in an upper loft or garret.

The Welch onions are propagated by sowing their seeds towards the end of July, in beds of a dry, but rich soil; and in three weeks after sowing they will appear above ground: they must be carefully kept from weeds. About October all their leaves die away, which has occasioned some to think the whole plantation lost, and to dig up the ground for some other use; but if they are suffered to stand, they will shoot up again very strong in January, and from that time will grow very vigorously, and be fit to draw for young onions in March; they are extremely green and fine, and more valued at market at that season than any other kind; but they are much stronger than any other onions, and have very much the taste of garlick.

OPULIFOLIA, a species of Spiræa. See the article SPIRÆA.

ORACH, or ARACH, *Atriplex*, a genus of plants ranged by Linnæus among the *polygamia monoecia*, and of which there are eight species. 1. Orach with a shrubby stalk, and intire leaves, shaped like a Greek delta, commonly called Sea Prussane-tree. 2. Orach with a shrubby stalk, and oval leaves. 3. Orach with an herbaceous stalk and sinuated, waved alternate leaves, shaped like a Greek delta. 4. Orach with an erect herbaceous stalk, and triangular leaves, or the garden Arch. 5. Orach with an herbaceous stalk, and delta-shaped, spear-shaped, obtuse indented leaves, meally underneath. 6. Orach with an herbaceous stalk, and the female valves large, sinuated and delta-shaped. 7. Orach with an herbaceous petulous stalk, spear-shaped, delta-shaped leaves, and indented cups in the disk to the seeds. 8. Orach with an erect herbaceous stalk, and all the leaves linear and intire.

The first species is a shrubby plant, which grows in hedges on the sea-coast of Portugal, Spain, and Virginia.

The second species is also a shrubby plant, which grows naturally near the sea in England, and in other countries in the north of Europe.

The third and fourth species are annual plants, and natives of Tartary.

The fifth, sixth, seventh, and eighth species are annual plants.

Culture of the ORACH.

The first and second species are propagated by cuttings planted in any of the summer months on a shady border: they must be gently watered, and in autumn be transplanted to the places in which they are designed to remain.

All the other species are propagated by seeds, which should be sown early in the spring, or in autumn, after they are ripe. When the plants are about an inch high they must be hoed and cut down where they are too thick, so as to leave them at the distance of four inches asunder. Let them be kept clean from weeds, and when they are about four inches high, they should be hoed a second time, and cut where they grow too close.

ORACH, a species of Goose-foot. See the article GOOSE-FOOT.

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ORANGE-TREE, *Aurantium*, according to Linnæus a species of Citrus, but by other botanists considered as a distinct genus, of which there are five species.

1. The common Seville Orange. 2. The China Orange. 3. The Willow-leaved, or Turkey Orange. 4. The Pampelmoes, or Shaddock. 5. The Dwarf, or Nutmeg Orange.

There are many varieties of the Orange-tree, the following of which are propagated in our gardens. 1. The horned Orange. 2. The double flowering Orange. 3. The yellow and white striped leaved Orange. 4. The curled leaved Orange. 5. The hermaphrodite Orange.

The Seville Orange is the most hardy of all these trees; and those with the striped leaves are the most tender.

Culture of the ORANGE-TREE.

If the gardener intends to raise stocks for budding of Oranges, he should procure some Citron-seeds which were properly ripened; or some Seville Orange seeds, but those of the Citron are to be preferred. The best seeds are those taken from rotten fruits, which in the spring of the year are easily procured; these must be sown in pots of good rich earth, and plunged into a hot-bed of tanners bark. In three weeks or a month the plants will come up, and in about six weeks after their appearance, will be fit to transplant into single pots: the hot-bed must then be renewed, and having prepared a number of small halfpenny pots, fill them half full of fresh loamy earth, mixed with very rotten cow-dung; then shake out the young plants from the seed-pots, with all the earth about them; place one plant in each of the pots, then fill it up with the same earth, plunge the pots into the new hot-bed, give them a good watering to settle the earth to their roots, and observe to screen them from sun in the heat of the day. The latter end of July you must begin to harden them by degrees, first raising the glasses very high, and when the weather is good take them quite off; but in the violent heat of the day they must always be shaded with mats. Toward the end of September they should be removed into the green-house, where they must be placed near the windows, and during the winter often refreshed with a little water.

In the spring the pots may be plunged into a gentle hot-bed; but they must be hardened by the beginning of June, that they may be in right order to bud before August. When you have budded the stocks, from whatever kinds you think proper, they should be removed into the green-house, turning the buds from the sun; but allow them as much free air as possible, and refresh them often with water. In about a month after budding, you will see which of them has taken, and you must untie them, that the binding may not pinch the buds, and let them remain in the green-house all the winter. In the spring prepare a moderate hot-bed of tanners bark, and after having cut off the stocks about three inches above the buds, plunge the pots into the hot-bed, observing to give them air and water according to the heat of the weather, and always shade them from the heat of the sun in the middle of the day. The latter end of July you must begin to harden them that they may bear the winter in the green-house; here they must be kept warm for some time, for by being forced in the bark-bed, they will be rather tender the first winter. They will by this time have attained the height of three feet, which is sufficiently high for the stems; it will therefore be proper to stop the leading branch to force out lateral shoots, and after the first winter they will require no more care than other full-grown trees.

Always observe, at the time of budding the stocks, to make choice of cuttings from very thriving and fruitful trees; chusing such buds as are round, for these are much better and easier to part from the wood, than such as are flat.

The above is a regular and certain way of supplying a green-house with Orange-trees, but there is a much more expeditious one, which is the purchasing such trees as are brought over every year from Italy. These are as large when we receive them, as those of our own produce,

duce, will be in ten or twelve years growth; and though they have but small heads then, will be brought to have very good ones in three years, and to produce very fine fruit. In the choice of these trees, those which have two buds in stock are preferable to those which have only one; and the straitness of the stem, freshness of the branches, and plumpness of the bark, are greatly to be regarded.

When you have purchased a proper number of these trees, each of them is to be set in a tub of water, with its head and half the trunk above the surface; they are to stand in this three days, then they are to be taken out, their roots picked, and brushed clean, and the tops of the branches cut off, after which they must be planted singly in pots just large enough to contain their roots, filled with a mixture of fresh earth and rotten cow-dung. These are to be set in a moderate hot-bed of tanners bark; and some potsherds must always be put at the bottom of the pots, to keep their holes from being stopped, and give a free passage. They are to be moderately watered at proper times, and by the month of June, they will have sent out very long shoots, which must be stopped, in order to produce the lateral branches.

They should now be hardened by degrees, and in the middle of July must be brought into the open air, and placed in some warm situation, defended from winds, and from the too great heat of the sun. In September they must be removed into the green-house, and watered gently during the winter. The succeeding summer the branches must be stopped from growing to their lengths, to furnish a good head; and they must be frequently watered; after this, they will require no farther management, but to be new potted every year; which should be done in April. The roots should be soaked a quarter of an hour in water, and afterwards scrubbed very clean, before they are put into the new pots.

If old Orange-trees have bad heads, the way to mend them is to cut the greater part of them off, and proceed with them in the same manner as with the trees brought from Italy.

All Orange-trees require frequent, but gentle waterings; there must always be a passage for the water to run off at the bottom of the pot or tub; they must have as much free air in winter as the season will allow, and they should not be set too near each other in the green-house. In summer they should be placed where they may have the morning and evening sun, without too much wind; and they should not be housed till October.

The best compost for Orange-trees is two thirds of fresh earth from a good pasture, which should not be too light nor over stiff, but rather a hazle loam: this should be taken about ten inches deep with the sward, which should be mixed with the earth to rot, and one third of neats-dung. These should be mixed together at least a twelvemonth before it is used, observing to turn it over every month, to mix it well and to rot the sward; this will also break the clods, and cause the mould to be finer. Before you make use of this earth, you should pass it through a rough screen, to separate the great stones, and the roots of the sward from it: but by no means sift the earth too fine; for this is very prejudicial to most plants, particularly to Orange-trees.

Mock ORANGE. See the article SYRINGA.

ORANGE-MINT. See the article MINT.

ORCHARD, a plantation of fruit-trees. In planting an orchard, great care should be taken that the soil is suitable to the trees planted in it; and that they are procured from a soil nearly of the same kind, or rather poorer than that laid out for an orchard. As to the situation, an easy rising ground, open to the south-east, is to be preferred. Mr. Miller recommends planting the trees fourscore feet asunder, but not in regular rows; and would have the ground between the trees plowed, and sown with wheat and other crops, in the same manner as if it was clear from trees, by which means the trees will be more vigorous and healthy, will abide much longer, and produce better fruit. If the ground has been

pasture, the green-sward should be plowed in the spring before the trees are planted; and if it be suffered to lie a summer fallow, it will greatly mend it, provided it be stirred two or three times to rot the grass and prevent the growing of weeds. At Michaelmas it should be plowed pretty deep, in order to make it loose for the roots of the trees, which if the soil be dry, should be planted in October; but if it be moist, the beginning of March will be a better season. If several sorts of fruit-trees are to be planted on the same spot, you should observe to plant the largest growing trees backwards, and so proceed to those of less growth, continuing the same method quite through the whole plantation; by which means the sun and air will more easily pass through the whole orchard. When you have planted the trees, you should support them with stakes, to prevent their being blown out of the ground by the wind; and the following spring, if the season should prove dry, cut a quantity of green turf, and lay it about the roots, with the grass downwards; by which means a great expence of watering will be saved; and after the first year they will be out of danger. Whenever you plow the ground betwixt these trees, you must be careful not to go too deep amongst their roots, which would greatly damage the trees; but if you do it cautiously, your stirring the face of the ground will be of great service to them: though you should observe, never to sow too near the tree, nor to suffer any great rooting weeds to grow about them; because this would starve them, by exhausting the goodness of the soil, which every two or three years should be mended with dung or other manure, which will be absolutely necessary for the crops sown between. These trees, after they are planted out, will require no other pruning besides cutting off their bad branches, or such as cross each other.

OREOSELINUM, a species of Spiguel. See the article SPIGUEL.

ORIGANY, *Wild*, or *Pot* MARJORAM, *Origanum*, a genus of plants, ranged by Linnæus among the *didynamia gymnospermia*, and of which there are ten species. 1. *Origanum*, with fleshy, woolly leaves. 2. *Origanum*, with under leaves woolly, and nodding spikes of flowers; or the *Dittany* of Crete. 3. *Origanum*, with all the leaves smooth, and nodding spikes of flowers. 4. *Origanum*, with long upright prismatical spikes, growing in clusters, and membranaceous bractæ twice the length of the cup. 5. *Origanum*, with oval, acute, sawed leaves, and spikes of flowers disposed in umbellated bunches. 6. *Origanum*, with long spikes growing in bunches, and bractæ as long as the cup. 7. *Origanum*, with roundish, paniculated spikes, gathered in clusters, and oval bractæ longer than the cup. 8. *Origanum*, with oblong, hairy spikes, growing in bunches, and heart-shaped, woolly leaves. 9. *Origanum*, with long, hairy spikes growing by threes, upon the foot-stalks; and oval, hairy leaves. 10. *Origanum*, with oval, obtuse leaves, and roundish, compact, hairy spikes.

The first species is a native of Egypt, and is a perennial plant.

The second species is also perennial, and a native of Crete.

The third species grows naturally in Phrygia.

The fourth and sixth species are natives of the southern parts of Europe.

The fifth species is a native of Crete and Smyrna.

The seventh species grows naturally in thickets, and among bushes, in many parts of England.

The eighth species grows wild in Syracuse.

The ninth and tenth species are natives of different parts of Europe.

Culture of the ORIGANY.

The first, second, and third species are propagated by slips or cuttings planted in any of the summer months on a border of good earth; they must be shaded from the sun, and duly watered, and after they have taken root let them be planted in small pots, filled with light kitchen-garden earth, and placed in the shade till they have taken new root: they may then be removed into an open situation, where they may remain till the end of October,

October, when they must be placed under shelter.

The fourth, fifth, and sixth species are propagated by parting of the roots in autumn, in a dry soil and warm situation.

The seventh species will rise plentifully from scattered seeds, or may be propagated by parting of the roots in autumn, and will thrive in any situation: it requires no other care but to be kept clear from weeds.

The eighth and ninth species are propagated from cuttings or slips in the same manner as directed for the first sort.

The tenth is an annual plant, and is propagated by seeds sown on a warm border, towards the end of March. When the plants are come up about an inch high, they should be transplanted into beds of rich earth, at the distance of six inches one from another, observing to water them duly till they have taken new root, after which they will require no care but to keep them clean from weeds.

ORPINE, *Telephium*, a genus of plants, ranged by Linnæus among the *pentandria trigynia*: of which there is only one species.

It is a perennial plant, and a native of France.

Culture of the ORPINE.

It is propagated by seeds, which should be sown in autumn, upon a bed of fresh, light earth; when the plants are come up, they should be thinned so as to stand six or eight inches asunder: they must be constantly kept free from weeds, and if the seeds are permitted to scatter, the plants will come up, and will require no other care than to be kept clean from weeds.

ORPINE, a species of the Lesser Houseleek. See the article *Lesser HOUSELEEK*.

Lesser ORPINE, or LIVE-EVER, *Crassula*, a genus of plants, ranged by Linnæus among the *pentandria pentagynia*, and of which he enumerates ten species: all of them are kept in botanic gardens for the sake of variety, but one only is admitted into other gardens, viz. Lesser Orpine, with plain, cartilaginously, ciliated leaves, joined at the base, and surrounding the stalklike sheaths; or Crimson Crassula.

This plant is a native of the Cape of Good Hope, and other parts of Africa. The root is thick and spreading: the stem where naked is of a dusky brown, firm and hard. The leaves are singular and very beautiful: they are oblong, broad, and sharp-pointed: of a firm substance, a yellowish green colour, and edged with a filmy rim. At the base they grow together, and encompass the stalk. The flowers are numerous and extremely elegant: they are large, and stand in great tufts in the manner of umbels; their colour is a bright and glowing crimson.

Culture of the Lesser ORPINE, or Crimson CRASSULA.

The best method of propagating it is by seeds, which should be sown early in the spring, in a pot filled with pasture-ground, and one fourth part of rotted cow-dung: set this pot up to the rim in a bark-bed of a moderate heat, and once in two days give it a very slight sprinkling of water. When the plants come up let them be gently watered, and have plenty of fresh air in the middle of the day, and when they have attained to a little height let each be planted in a separate pot filled with the same compost, and set up to the rim in a bark-bed: the plants must be gently watered, and the glasses covered with a mat during the heat of the day.

When the plants are well rooted, let them be gradually inured to the open air, after which they will require to be shifted into larger pots. They may be set out in summer among the exotics which bear that exposure, and at the approach of winter be removed to the greenhouse, where, if rightly managed, they will continue to flower from July to the end of winter.

It may also be propagated by cuttings during any of the summer months, but this is not so good a way as raising the plants from seeds.

Bastard ORPINE, *Andrachne*, a genus of plants, of which there is but one species. It is a native of Italy.

Culture of the Bastard ORPINE.

It is propagated by seeds, which should be sown on a

bed of common earth in the autumn, soon after they are ripe: sometimes the plants will come up the following spring, but the seeds will frequently remain in the ground till the next year. It should be sown where it is designed to remain, and will require no other culture but to keep the plants clear from weeds. It must have a light dry soil and a warm situation.

OSTRYA, a species of Hornbeam. See the article *HORNBEAM*.

OTHONNA, *Ragwort*, a genus of plants, ranged by Linnæus among the *syngenesia polygamia necessaria*, and of which there are several species, but the culture of the four following will be a sufficient direction to the gardener for that of all the rest. 1. Othonna, with pinnatifid leaves, and narrow parallel segments. 2. Othonna, with spear-headed, undivided leaves. 3. Othonna, with roundish but somewhat kidney-shaped leaves, dented at the edges, and placed on foot-stalks. 4. Linear-leaved Othonna.

The root of the first species is woody, brown, divided, spreading, and hung with many fibres. The stem is also woody, and is covered with a rough brown bark, and with the remains of many fallen leaves, whose foot-stalks are more durable. The branches are numerous and their bark is greyish. The leaves are scattered over them without order, and they are of a pleasing figure; they are oblong, considerably broad, and divided on both sides almost to the rib, into a great number of long, narrow, and parallel segments; the colour of these is a whitish green, and they are hoary. The foot-stalks are sometimes reddish, and the rib in the middle is frequently a little tinged in the same manner. The flowers are large and yellow: they are placed on long, slender, whitish and hoary foot-stalks, terminating the tops of the branches; they are of the radiated kind, and have the rays particularly long: these are of a very fine strong yellow, and the disk in the center, which is small, is of a very deep tinct of the same kind. The seeds are numerous and winged with down. The flower is of an unpleasant smell, but the leaves when rubbed in the hand are not disagreeable. The cup in which the flower stands is formed of a single piece, and is of a plain structure, hollow, and at the rim divided into eight segments. The floscules contained in the body of the flower are of two kinds, tubular and ligulated; the tubular floscules occupy the center, and are numerous; the ligulated floscules are few, and stand at the verge. The tubular contains five filaments, whose buttons are of an oblong form, and unite in a cylinder, and in the midst of these is placed a single style. In the ligulated, which are female floscules only, there are no filaments: these contain the rudiment of a seed, from which rises a single style, split at the top.

The root of the second species is white and fibrous. The plant rises to four feet in height. The stalk is round, hard, in some degree woody: smooth on the surface, purplish towards the base, and, in the rest of its height of a whitish green. The leaves are very long and beautiful: they grow to the stalk by a hollow base, and from that part where they are broadest diminish to a point; they are lightly and irregularly waved or sinuated, and their colour is a fine blueish green. The flowers are placed in great tufts at the tops of numerous branches, which rising from the bosoms of the upper leaves, form, in the whole, a broad and spreading umbell, they are small; their colour is yellow, paler in the rays, and deeper in the disk. The seeds which follow these are winged with down. The cup in which each flower stands, is formed of a single piece, cut into deep segments at the top: these are twelve, and they are narrow and pointed. The flower is composed of two sorts of floscules: those in the center of the disk are the most perfect; they are tubular, and nipped into five segments at the edges, and in each of these stand five filaments with coalescent buttons.

The root of the third species is long, white, tender, and hung with many fibres. The stalks are numerous. The colour of these is brown toward the ground, and green upwards. The leaves cover these irregularly: they

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they have long foot-stalks, hollow on the upper side, rounded below, and of a pale green colour. The leaves are rounded on the outer edge, but hollowed to receive the stalk; they are sharply indented on the edges, and their colour is a pale green but lively, and often the ribs are reddish. The flowers cloath the tops of all the stalks in large tufts, resembling umbells, of a loose composition, each flower being large, and placed on a long foot-stalk. These are of the composite, radiated kind, but the rays are few: these are of a pale, and the disk is of a deeper yellow. The cup is formed of a single piece, rounded at the bottom, and divided at the edge into about eight oblong segments. The flower consists of a disk, formed of a multitude of tubular floscules, and surrounded by about eight female or ligulated floscules at the edge. The tubular floscules are very short, and they are divided into five segments at the rim: in these are placed five filaments with coalescent buttons. The female floscules are flat, oblong, and naturally, when ripe, turn back: these have no filaments, but from the rudiment of the seed there rises a single style with a large stigma, which is divided into two parts, and turned backward.

The root of the fourth species is reddish, divided, hung with innumerable fibres, and spreading. The main stem is thick, woody, and covered with a pale brown bark. The branches are pale, and the young shoots green. The leaves are numerous and placed irregularly: they are long, narrow, sharp-pointed, and of a pale green, a little hoary, and of a firm substance. The flowers are numerous and yellow: they stand in irregular broad tufts at the extremities of the branches, and are of the composite, radiated kind. The cup is composed of one piece, hollow at the base, and divided into five segments at the rim. The disk of the flower is composed of tubular floscules: these are short and divided at the rim into five segments, and in each there are five short filaments with convergent buttons. The rays are about eight, they are female flowers: their form is long and lanceolate, and they are cut into three parts at the end; they have at their base only the rudiment of a seed, with a single style terminated by a large split head. The seeds stand naked in the cup, and they are only a single series, for the female flowers alone bring any to perfection.

Culture of the OTHONNA.

This plant is propagated by sowing the seeds the end of February, upon a moderate hot-bed; and when they are large enough they must be planted singly in pots of a moderate size, filled with the following compost.

Take up a barrow of rich black mould from under the turf in a meadow, put to this a bushel of coarse sand, a bushel of pond-mud, and a peck of rotted cow-dung.

After they are planted in this compost they must be brought into a warm part of the garden, and set in the open air till the approach of autumn, and then removed into the green-house. If they are taken thence into the stove about the middle of October, they will be brought to flower in great perfection.

The second species is propagated by seeds sown in pots filled with some of the following compost.

Mix a barrow of meadow earth, half a barrow of pond-mud and a bushel of sand. Let the pots be set up to the rim in a bark-bed; and when the young plants rise, let all except three or four be pulled up. Let these, by frequent waterings, be brought to a height fit for transplanting; they must then be placed each into a separate pot; and again set in the bark-bed till rooted. Then let them by degrees be inured to the air. They may then be set out in summer, among the green-house plants, and in autumn taken into shelter with them.

The third species is a biennial plant, and must be propagated by seeds, which may be easily had from the Cape.

Let a compost be made for their reception thus:

Mix two bushels of rich black mould from under the turf in a meadow, and one bushel of pond-mud; add two pecks of mellow earth from under a wood-pile; and when all are thus well blended together, fill a couple of

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garden-pots with it. Scatter the seeds carefully over the surface, and sift over them a very thin covering of the same mould. Set these pots up to the rim in a bark-bed, and give them once in three days a gentle watering. When the plants come up, take up the weakest where they grow too close, and leave one strong plant in the middle of each pot; this is never to be transplanted: but three or four may for the present be left at due distances in each pot, to be removed afterwards. As these rise in height, let them have air in the middle of the day; and water once in two or three days. About the fifth week from their first appearance, let a couple of the best of these be planted in middle-sized pots, and the others in very small ones, leaving only the single plants intended in the original pots. These new planted ones must be set up to the rim of the pots in the bark-bed, and shaded and watered till they have taken root: after this, they are by degrees to be inured to the air; and at the approach of cold weather, placed in the green-house. Early the following spring, let those in the small pots be carefully shoo out, and planted in different warm and sheltered spots in the open ground; and of the others let some be tied up to sticks, thrust into the pots for that purpose; and others left to fall and hang their own way over their edges. They will all flower the succeeding autumn; and, with good management, through the whole winter.

The fourth species may be propagated, and managed in the same manner as the third.

OX-EYE, *Bupthalmum*, a genus of plants ranged by Linnæus among the *syngnesia polygamia superflua*, and of which there are seven species. 1. Ox-eye with spear-shaped opposite leaves, and foot-stalks with two teeth. 2. Ox-eye with acute leafy cups, alternate branches, and entire spear-shaped leaves embracing the stalks. 3. Ox-eye with blunt leafy cups growing close to the sides of the stalks, and oblong blunt leaves. 4. Ox-eye with blunt leafy cups upon foot stalks, alternate branches, and wedge-shaped leaves. 5. Ox-eye with spear-shaped, sawed, hairy leaves, and naked. 6. Ox-eye with smooth, spear-shaped, indented leaves, and naked cups. 7. Ox-eye with leafy cups, heart-shaped, sawed leaves, having three veins, and the base on one side shorter than the other.

The first species is a perennial plant, and grows naturally in Jamaica and Virginia.

The second species is an annual plant, and a native of Italy and Spain.

The third species grows naturally in Crete and Portugal, and is also an annual plant.

The fourth species is a native of Sicily, and is a perennial plant.

The fifth and sixth species are natives of the southern parts of Europe, and are perennial plants.

The seventh species grows naturally in North America, and is likewise a perennial plant.

Culture of the OX-EYE.

The first species is propagated by cuttings, which should be planted in July, in small pots filled with light loamy earth, and plunged into a very gentle warmth, shaded from the sun in the heat of the day, and moderately refreshed with water. When the plants have taken root, which will be in about six weeks, they must be gradually inured to bear the open air, and soon after planted each in a separate small pot, filled with some of the same earth, and placed in the shade till they have taken fresh root; after which let them be removed into shelter, and about the middle of October be taken into the green-house; and in summer placed abroad in a sheltered situation.

The second and third species are propagated by sowing the seeds in April on open borders, where the plants are designed to remain, and will require no other care but to be kept clear from weeds, and thinned to the distance of a foot and a half.

The fourth species is easily propagated by slips during the summer season: if the cuttings are planted in a bed of fresh loamy earth, and covered with a hand-glass, shaded in the heat of the day, and frequently refreshed

with water, in about six weeks they will have taken root, after which they may be managed as directed for the first species.

The fifth, sixth, and seventh species are propagated by parting of the roots. The best time for transplanting and parting them is about the end of October. They are hardy plants, and will thrive in any situation, but should be removed every other year to prevent their spreading too far.



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PALM-TREE, *Palma*, a genus of plants of which there are fourteen species. 1. Palm-tree, with winged leaves, whose lobes are narrow, and terminated by spines; or Date-tree. 2. Palm-tree with winged leaves, whose lobes are folded back, foot-stalks proceeding from the sides of the branches, and a large angular fruit; commonly called Cocoa-nut. 3. Palm-tree with winged leaves, which are every way armed with black spines, bearing a larger fruit; commonly called great Macaw-tree. 4. Palm-tree with winged leaves, whose lobes are folded back, and prickly branches, whose thorns often come by pairs, and are black. 5. Palm-tree with winged leaves, an equal trunk, and a smaller fruit; commonly called the Cabbage-tree. 6. Palm-tree with winged leaves, a taper prickly stalk, and a smaller fruit; called Prickly Pole. 7. Palm-tree with winged leaves, having narrow plain lobes, and prickly midribs; commonly called oily Palm-tree. 8. Palm-tree with hand-shaped winged leaves which are plaited, and scaly stalks; called Palmetto, or Thatch. 9. Palm-tree with winged leaves, whose lobes are linearly spear-shaped, and prickly foot-stalks. 10. Palm-tree with winged branches, whose lobes are rigid, alternate, and terminated by prickles. 11. Palm-tree with hand-shaped winged leaves, whose lobes are folded backward, and are hoary on their under side. 12. Palm-tree with a club-shaped fruit containing many seeds. 13. Palm-tree with winged leaves, whose lobes are spear shaped, plaited, and come out by pairs from one point, standing thinly along the midrib. 14. Palm-tree with single, entire, flaccid leaves; commonly called Dragon tree.

For the description, and manner of culture of the first species, see the article DATE-TREE.

The second species is the Cocoa-nut. The branches of this tree are winged like the Date-tree, but the small leaves or lobes are three times as broad; they open flat, their borders fold backward, and are of a lighter green than those of the first sort. The whole branch is often twelve or fourteen feet long; the male flowers grow in different parts of the same tree, with the fruit proceeding from the trunk between the leaves; the nuts growing in very large clusters, which are covered with a thick fibrous coat adhering closely to them. The nuts are large, oval, and have three holes in the shell at the top: the kernel is firm, white within, and the shell contains a quantity of pale juice, which is called the milk.

The third species is the Macaw-tree, for which see the article MACAW-TREE.

The fourth species is a native of La Vera Cruz. It has winged leaves or branches. The small leaves or lobes are narrow; they spread open, are flat, and their edges fold backward; their ends are blunt, and have no spines; the midrib is armed with long black spines, which frequently come out by pairs from the same point. The flowers are placed between the leaves, and the fruit grows on the same plant as the male flowers.

For the fifth species, see the article CABBAGE-TREE.

The sixth species is a native of Jamaica, where it is called Prickly Pole. It rises to the height of forty feet. The stem seldom exceeds six inches in diameter; it is closely armed with long thorns. The leaves are winged, armed with thorns, and placed circularly on the top. The flowers grow in the same manner as those of the

cocoa nut. The fruit is about the size of a large pea, it is flattened at the top, and covered with a red skin.

The seventh species is called in the West-Indies Oily Palm. The leaves of this tree are winged, the small leaves or lobes are long and narrow. The flowers grow from the top of the stem, the female ones are succeeded by berries shaped like an olive, but larger.

The eighth species rises with a slender stalk, which is naked and smooth, ten or twelve feet high; at the top are many fan-shaped leaves placed circularly, and having foot-stalks two, and sometimes three feet long, which are armed with a few strong, green, crooked spines; the lobes all meet in one centre, where they join the foot-stalk, and are connected together a third part of their length from their base: they are at first closely folded into plaits, but afterwards spread out like a fan; their ends often droop, and between the lobes hang long threads. The flowers and fruit grow from between the leaves, the latter is of the size and shape of a small olive.

The inhabitants of Jamaica, where this tree is a native, call it Palmetto-tree, or Thatch.

The ninth species is a native of Malabar. It rises with a straight trunk about forty feet high. The stalks are terminated by an obtuse cone, just below which the leaves are placed: those on the large trees are eight or nine feet long, but those of the small plants are much less. The base of the foot-stalk, which partly embraces the trunk, is broad and three-cornered, and is armed on each side with short spines to the place where the lobes or small leaves begin. These lobes are long, narrow, and entire, of a lucid green on their upper side, standing by pairs very close along the mid-rib. The flowers and fruit are produced in large bunches at the foot-stalks of the leaves; the fruit is oval, about the size of a large plum, and nearly of the same shape: the skin or covering when ripe is of a bright red, under which is a hard brown shell, which incloses a white nut.

The tenth species is a native of St. Helena. The leaves are ten feet long; the mid-rib or foot-stalk is broad, and flat on the under side, but rises with a sharp ridge on the upper; the small leaves or lobes are ranged alternately on the sides: these are from two feet and a half to nine or ten inches long, the longest being at bottom, decreasing gradually to the top; they are stiff, fold inward, and in a sharp thorn, and are of a dark green.

The eleventh species grows naturally on the mountains near Panama. The leaves stand upon long foot-stalks, which are broad at the top, and have a sharp ridge or angle underneath. The lobes are placed circularly, meeting in a point at their base, where they join the foot-stalk: they are divided to the bottom, are two feet long, three inches broad in the middle, and fold backward; they are of a deep green on their upper side, and of a russet colour on their under at first, but afterwards become white.

The twelfth species is a native of America. It has a thick stem, which seldom rises more than two feet high. The leaves grow round the upper part of the stem, standing upon foot-stalks, which are a foot and a half long, and one and a half broad in the middle, drawing to a point at both ends; they are smooth, stiff, entire, and of a pale green. The fruit rises up from the side of the stem, upon a short, thick foot-stalk, it is shaped like a club, and has many separate cells, which contains a number of red seeds.

The thirteenth species is a native of the Spanish West-Indies. It rises with a very tall naked trunk: at the top stand long-winged branches or leaves, whose lobes are spear-shaped and plaited. The flowers grow in long bunches between the leaves. The fruit, which is about the size of a middling plum, is collected into large bunches.

For the fourteenth species, see the article DRAGON-TREE.

Culture of the PALM-TREE.

All the species of Palm are propagated by seeds, which should be sown in the manner directed for the Date-tree. See the article DATE-TREE.

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The culture is also much the same, only observe that such of them as are natives of very warm countries will require to be kept in a warmer air. The second, fourth, seventh, eighth, twelfth, and thirteenth sorts, must be kept constantly in the bark-bed of the stove.

The sixth, ninth, tenth, and eleventh species may be kept in a dry stove in the winter, in a moderate temperature of heat, and in the hottest part of summer they may be exposed to the open air in a warm, sheltered situation. These plants should have but little water during the winter season, and in the summer they must not be often watered unless the season is very dry. As they increase in size they must be shifted annually into larger pots, taking great care in the removing them not to cut their principal roots. The earth in which they are planted should be light, that the moisture may easily pass off.

For the management of the first, third, fifth, and fourteenth species. See the articles DATE-TREE, MACAW-TREE, CABBAGE-TREE, and DRAGON-TREE.

PANICLE, a stalk diffused into several pedicles, or foot-stalks, sustaining the flowers or fruits, as in oats, &c.

PANSIES or HEARTS-EASE. See the article HEARTS-EASE.

PAPAW-TREE, *Carica*, a genus of plants, ranged by Linnæus among the *diccia decandria*, and of which there are only two species. 1. Papaw-tree, with the lobes of the leaves sinuated. 2. Papaw-tree, with the lobes of the leaves entire.

The first species is a native of the Indies, and the second of Surinam.

Culture of the PAPAW-TREE.

These species are both propagated by seeds, which should be procured from the places in which they naturally grow. These should be sown on a hot-bed early in the spring, and when the plants are near two inches high, they should be each transplanted into a separate small pot filled with a light loamy earth, and plunged into a hot-bed of tanners bark, carefully shading them from the sun, till they have taken root; after which they may be treated in the manner of other tender exotic plants.

They should have very little water, and care should be taken when the plants are shifted from small pots into larger ones, to preserve the whole ball of earth to their roots. As the plants advance in growth they will require larger pots, and when they are too tall to remain under frames, they must be placed in the tan-bed of the bark-stove, where they should constantly remain. In winter they should have very little water, and the waterings in summer should be gentle and often repeated: by this management the plants will, in about three years, produce their flowers and fruit in great perfection.

As they grow to eighteen or twenty feet in height, the stove must be continued as to receive them.

PATHELOACEOUS, an appellation given to the flowers of certain plants, from their resembling the figure of a butterfly; they consist of four petals, whereof that which covers the others is called the vexillum, or the standard; the two petals placed on each side are called the alæ, or the wings; and the lowest petal is termed the carina, or keel, which is a concave petal or segment, resembling the lowest part of a boat; the keel is sometimes entire, and sometimes it consists of two petals or segments, adhering pretty closely together.

PAPPOSE, an appellation applied to such seeds as are covered with a down, which adheres to the upper part of the seed, and is of use to spread them when ripe, by sustaining them in the air, so that they may be conveyed to a great distance. The word is derived from

PAPPUS, which signifies the down that grows on certain seeds. See the last article.

PARASITICAL PLANTS, such as are produced out of the trunk or branches of other plants, from whence they receive their nourishment, and will not grow upon the ground.

PARK LEAVES, a species of St. Johnswort. See the article ST. JOHNSWORT.

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PARKINSONIA, a genus of plants, of which there is only one species.

This tree rises to the height of twenty feet, and bears long, slender bunches of yellow flowers, which perfume the air to a considerable distance, with a most agreeable sweet scent.

Culture of the PARKINSONIA.

It is propagated by seeds, which should be sown early in the spring in small pots filled with light fresh earth, and plunged into a hot-bed of tanners-bark; in about three weeks or a month the plants will come up, when they should be kept clear from weeds, and frequently refreshed with water. In a little time they will be fit to transplant, which should be done very carefully, so as not to injure their roots. They must be each planted into a separate small pot filled with light fresh earth, and plunged into the hot-bed again, observing to stir up the tan, and if it has lost its heat, there should be some fresh tan added to renew it again. The plants must be shaded from the heat of the sun till they have taken new root, after which they should have fresh air admitted to them every day, in proportion to the warmth of the season. By the beginning of July the plants will have filled the pots with their roots, when they should be shifted into pots a little larger than the former, and plunged again into the bark-bed. As soon as they have taken fresh root, they should by degrees be inured to the open air; and in September they must be removed into the dry stove, and placed on shelves at the greatest distance from the fire, when they will retain their leaves all the winter.

PARSLEY, *Apium*, a genus of plants, ranged by Linnæus among the *pentandria digynia*: of which there are four species. 1. The common Parsley. 2. The curled Parsley. 3. The large-rooted Parsley. 4. Smallage, or water Parsley.

Culture of the PARSLEY.

All these species require the same culture. The seeds should be sown early in the spring in drills, by the borders in the kitchen-garden. When the plants come up they must be kept clean from weeds.

If the roots of the Parsley are designed for medicinal uses, the seeds must be sown thin; and when the plants are come up they must be hoed out singly, as is practised for carrots, onions, &c. and kept clean from weeds. The roots will be fit for use by July or August.

Macedonian PARSLEY, *Bubon*, a genus of plants, ranged by Linnæus among the *pentandria digynia*, and of which there are four species. 1. Macedonian Parsley, with oval, rhomboid, crenated leaves, and a great many umbels. 2. Macedonian Parsley, with smooth, sawed, rhomboid leaves, and a few umbels. 3. Macedonian Parsley, with smooth leaves, the lower ones rhomboid and sawed, and the upper ones winged, and indented in three parts. 4. Macedonian Parsley, with narrow leaves.

The first species is a biennial plant, and a native of Macedonia. The second and third species are shrubby plants, and natives of Ethiopia, but are seldom cultivated in gardens. The fourth species is a perennial plant, and grows naturally in Sicily.

Culture of the Macedonian PARSLEY.

The first and fourth species are propagated by seeds, which should be sown in April on a bed of light sandy earth. When the plants come up they must be kept weeded, and about the beginning of October carefully transplanted into a warm border.

PARSNAP, *Pastinica*, a genus of plants, ranged by Linnæus among the *pentandria digynia*, and of which there are only two species. 1. Parsnep, with single-winged leaves; or the garden Parsnep. 2. Parsnep, with decompounded leaves.

Culture of the PARSNEP.

It is propagated by sowing the seeds in February or March, in a rich mellow soil, which must be dug deep that the roots may be able to run into the ground without hindrance.

It is a common practice at the time of sowing Parsneps to sow carrots upon the same ground, and if the carrots are

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are designed to be drawn young there is no harm in it. The Parsneps, when they are grown up a little, must be thinned to a foot distance, and carefully kept clear of weeds. They are best tasted just at the season when the leaves are decayed; and such as are desirous to eat them in spring, should have them taken up in autumn, and preserved in sand.

When the seeds are to be sowed, some very strong and fine plants should be left at four feet distance, and towards the end of August, or in the beginning of September the seeds will be ripe: they must then be carefully gathered, and dried on a coarse cloth. They should always be sown the spring following, for they do not keep well.

Cow PARSNEP, *Sphondylium*, a genus of plants, of which there are five species. 1. Common hairy Cow Parsnep. 2. Hairy Cow Parsnep, with narrow leaves. 3. Great Cow Parsnep. 4. Small Alpine Cow Parsnep. 5. Smooth Alpine Cow Parsnep.

The first and second species are natives of this country. The third grows naturally in the Levant and Siberia. The fourth sort is a native of the Alps, and the fifth grows naturally on the Alps and Appennines.

Culture of the Cow PARSNEP.

These species are all propagated by seeds, which should be sown in autumn, in drills at three feet distance, here the plants are to remain. In the spring, when the plants appear, they should be thinned so as to leave them eighteen inches asunder in the rows, after which they will require no farther care than to be kept clear from weeds. The second year they will produce flowers and seeds, after which their roots will die. Their seeds should never be permitted to scatter, for it would soon render them very troublesome weeds.

Prickly PARSNEP, a genus of plants, of which there are only two species. 1. Prickly Parsnep, with awl-shaped leaves, which are entire, having thorns. 2. Prickly Parsnep, with cut leaves without thorns.

These plants grow naturally on the borders of the Mediterranean sea. The leaves of the first species terminate in two or three sharp thorns, and the flowers of the second have a short prickly involucre.

Culture of the Prickly PARSNEP.

These plants are propagated by their creeping roots; the best time to transplant them is the beginning of March, a little before they shoot. The roots should be planted in a gravelly or sandy soil, and in a warm situation, or they will require covering in the winter to prevent the frost from destroying them.

Water PARSNEP, *Sium*, a genus of plants, of which there are eight species, but one of these only is cultivated in gardens; viz. Water Parsnep, with winged, lower leaves, and those under the flowers trifoliate, commonly called the Sifarum or Skirret.

This plant is a native of China and has a perennial root.

Culture of the Water PARSNEP.

It may be propagated either by sowing the seeds, or by planting the slips and off-sets, but the first is much the best method. The seeds should be sown on a moist, rich soil, in the beginning of February. In April the young plants will come up, when they must be cleared of weeds and hoed up to three inches asunder; and about a month after they must be thinned a second time, leaving them at six inches distance. After this they must be carefully kept clear from weeds, and when their leaves are decayed, they should be taken up for use; but this should only be done as they are wanted, for they spoil with lying out of the ground.

The leaves decay in October, and from that time till the middle of March the roots are in season, after which time they become good for little.

PARTERRE, a level division of ground, which for the most part faces the south and best front of the house, and is generally furnished with greens, flowers, &c.

There are several sorts of Parterres, as plain grass with borders, and Parterres with embroidery, &c.

Plain Parterres are more beautiful in England than in any other country, by reason of the excellency of our

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turf, and that decency and unaffected simplicity that it affords to the eye of the spectator. Other Parterres are cut into shell and scroll work, with sand alleys between them; which sort of Parterres are esteemed finest in France.

As to the general proportion of Parterres, an oblong, or long-square, is esteemed the best: therefore, a Parterre should not be less than twice as long as it is broad, twice and a half is accounted a very good proportions and it is very rare that three times is exceeded. As to the breadth of a Parterre, it is to take its dimension from the breadth of the front of the house; if the front of the house is one hundred feet long, the breadth of the Parterre should be one hundred and fifty feet; and if the front of the house be two hundred feet, the Parterre should be fifty feet broader: but where the front exceeds the breadth of this Parterre, it will be a good proportion to make the Parterre of the same dimensions with the front.

There should be a terrace-walk on each side of the Parterre, for an elevation proper for view; and therefore, there should never be the flat of a Parterre between terrace-walk and terrace-walk, above three hundred feet; nor can it be well made less than one hundred and forty. As to the adorning and furnishing these Parterres, whether it be plain or with embroidery, that depends much upon the form of them, and therefore must be left to the judgment and fancy of the designer.

PASQUE-FLOWER. See the article *Pasque-Flower*.

PASSION-FLOWER, *Passiflora*, a genus of plants ranged by Linnæus among the *gynandria pentandria*, and of which there are no less than twenty-four species, a particular description of all these would be needless, as they bear a great resemblance to each other, we shall therefore only mention one of the most beautiful, which is the Laurel-leaved Passion-flower. It is a native of South-America. The stem is weak and unable to support itself; but it will rise to the height of the tallest trees; its main trunk winding round them, and its innumerable branches spreading over their broad tops, and covering their whole extent with flowers and fruit. The trunk is covered with a rough grey bark. The tender stalks are green, and there rise yellow tendrils with the leaves. The leaves are very large, oblong, broad, smooth, pointed at the ends, waved at the edges, and of a fine green. The flowers rise with the leaves and tendrils, usually one leaf, one flower, and one tendril together; and for two months of autumn they are extremely numerous. The flower is placed in a large cup, composed of five coloured leaves, which are large, long, and pointed. The body of the flower is formed of several very broad and long petals, which naturally spread out, and afterwards fall backward: these are of a perfect snowy whiteness: within them is placed the nectarium forming a triple coronet. The outer circle of these three is large, and composed of long, slender, twisted filaments, and is of a celestial blue: this stands within the circle of the petals, and surrounds the style. The others are shorter, smaller, and paler coloured. The filaments rise within the inner coronet of the nectarium, and are five in number. They are fixed at the base of the rudiment of the fruit, and to the style, which is there of a column or form, and they spread outwards as they rise in height. They are slender, and of an orange-scarlet. The buttons that lie on these are oblong and obtuse. From the parts where the filaments are inserted, the body of the style rises upright, columnar and strait; and at its top from an oval bud, which is the rudiment of the fruit, there spread three divisions, which are largest towards the extremity, and are there crowned each with a kind of head. The fruit follows singly each flower, and is of the shape and size of an orange, and of a gold yellow.

There are three common kinds of this flower, which are the sorts chiefly cultivated in all our gardens; they are very hardy, and bear all the severities of our climate as if natives of it; for though the tender branches, and sometimes the main stem are destroyed in very severe winters, yet it always shoots up again from the root.

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Culture of the PASSION-FLOWER.

The Laurel-leaved Passion-flower is propagated by seeds, which should be sown upon a good hot-bed in the spring, and when the plants are fit to be removed, they should be each planted in a small pot filled with good kitchen-garden earth, and plunged into a bed of tanners bark, observing to shade them from the sun till they have taken new root, after which they must be treated like other tender plants from the same climate.

When they are too high to remain any longer under the glasses, they should be turned out of the pots, and planted in the stove, near the back; and at times give them a little water. Let them be led to climb, by placing sticks in an oblique direction, and leaning backwards. From time to time let any decayed leaves that are seen on them be picked off, and take care to train them to the wall, where their flowers will make a most beautiful appearance.

It may also be propagated by cuttings, and by laying down the branches, but the plants will never be so fine as those raised from seeds.

The same method of culture is proper for all the species of this plant, which require the heat of the stove to preserve them.

The other three species, already mentioned, are propagated by laying down their branches, which in one year's time will take good root, and may be removed to the places where they are designed to remain.

The best season for transplanting them is the latter end of March or the beginning of April: they should be planted against a wall, or other building, which faces the south-east or south-west; or else mixed among the flowering shrubs in quarters of large gardens; in this case they must be trained up to poles fixed in the earth for that purpose, and thus will flower well, and appear extremely beautiful.

The best time for pruning them is in the spring, and it is a good custom to lay some mulch a foot thick, at their roots, which will effectually preserve them from the severity of the winter, and is necessary when they are planted in the open quarters, and have not the defence of a wall behind them. The manner of pruning is to cut off entirely all the weak shoots, and shorten the strong ones to about three feet in length; when they are planted against high buildings, they may be left something longer than this, to fill up the wall; but this is not very necessary, for they are quick growing plants, and in open quarters they should always be pruned much shorter than this, to bring their flowers nearer the ground.

PEA, *Pisum*, a genus of plants ranged by Linnæus among the *diadelphia decandria*, and of which there are four species. 1. Pea with the lower stipulæ, roundish and indented, with taper foot-stalks, and many flowers on a foot-stalk, or the common Garden Pea. 2. Pea with trifoliate foot-stalks, indented stipulæ, and one flower on a foot-stalk. 3. Pea with foot-stalks plain on their upper side, an angular stalk, arrow-like stipulæ, and foot-stalks having many flowers. 4. Pea with membranaceous, running foot-stalks, having two leaves, and one flower on a foot-stalk.

There are a great variety of the first species now cultivated in this country, which are distinguished by different names. The second species grows wild among the corn in several parts of Europe, and like the first is an annual plant. The third species is a perennial plant, and grows wild near the sea, in several parts in the north parts of Europe. The fourth species is an annual plant, and grows naturally among the corn in Crete and Italy.

Culture of the PEA.

The method of raising early Peas is to sow them under warm hedges or walls about the middle of October. When the plants are come up, their stalks are to be kept earthed up, and thus they are to remain till the beginning of February, covering them against the severe frost with peas-haulm or other light covering. In January or February a moderate hot-bed must be made: the dung should be laid about two feet thick, and carefully beat down, and covered about six inches deep with

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light fresh earth. When the frames have been set on about four days, the plants should be transplanted to the bed, and set in rows at about a foot distance, and two inches one from another in the rows. They must be watered and shaded till they have taken root, after which they should have as much free air as possible; and when they begin to fruit they must be watered more frequently, which will be a means of their producing a greater quantity of fruit.

The common Dwarf-pea is the sort always used on this occasion, as all the rest ramble too much in their stalks.

The first sort of Pea, which should be sown to succeed those on the hot-beds, is the hot-spur, of which the gardeners distinguish three or four sorts, which differ very little from each other; but that called the Golden Houpur, is usually preferred to the rest.

These should be sown on warm borders in October, in the same manner as those intended for the hot-bed, and treated exactly the same: but in spring these are subject to be spoiled by slugs and other vermin; the best method of destroying which, is to slake a little lime, and throw over the earth among the plants.

Left this crop should miscarry by the severity of the weather, it is always proper to sow two others after it, at the distance of a fortnight each, after which there should be none sown till the end of January, and after that time two other crops should be sown at the beginning and end of February.

To succeed these, which will supply the table with early Peas, the Spanish Moratto, which is a large Pea, and a very plentiful bearer, should be sown in rows on a clear plat of ground; the rows should be two feet and a half distant, and the Peas dropped at an inch or two asunder; these must be all covered very carefully with earth, two inches deep, and the rooks, mice, and other vermin, prevented from getting at them. A fortnight after this, some other spot should be sown with this or some other large Pea; the same should be continued every fortnight till the beginning of June.

Heart PEA, *Cardiospermum*, a genus of plants of which there are three species. 1. Heart Pea with a small leaf and fruit. 2. Heart Pea with a large leaf and fruit. 3. Hairy Heart Pea with leaves divided by fives, and those divided again into three parts, which are bluntly cut, and have short foot-stalks.

These plants grow naturally in both Indies, where they climb upon whatever shrubs are near them, and there they rise to the height of eight or ten feet, but in England they seldom rise above half so high; they send out many side-branches which spread to a considerable distance every way. They are annual, and perish soon after they have perfected their seeds.

Culture of the Heart PEA.

All the three species are propagated by seeds, which should be sown upon a hot-bed in the spring, and when the plants are two inches high, they should be transplanted into pots, and plunged into a moderate hot-bed, where they must be carefully shaded till they have taken root, after which they must have a large share of fresh air admitted to them every day, to prevent their being drawn up weak: in a little time after they may be removed into a glass-case, where they may have room to grow, and be screened from the cold of the nights, but in warm weather they will require a large share of air. They will flower in July, and their seeds will ripen in autumn.

Sweet-scented PEA, a species of Chickling Vetch. See the article CHICKLING VETCH.

Everlasting PEA, another species of Chickling Vetch.

Winged PEA, a species of Lotus. See the article LOTUS.

PEACH-TREE, *Persea*, a species of *Amygdalus*, or Almond-tree.

The curious in fruits distinguish forty different varieties of peaches, but many of them seem very trifling distinctions. The fineness of this fruit, in general, depends on the firmness of the pulp, the delicacy of the flavour, and the thinness of the skin. A good peach should be of a fine deep red next the sun, and of a pale

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whitish hue next the wall; the pulp should be of a yellowish cast, and very juicy, and the stone should be small, though the fruit in general be large.

Culture of the PEACH-TREE.

The varieties of the peach are produced like those of the finer flowers, by sowing the seeds, and though many, raised this way, will be of little value, as is also the case in flowers, yet probably among a parcel of stones saved from the finer kinds of peaches, there would be some new kinds produced; which as they were raised here, would be easily kept up in their perfection; which is not to be expected of those brought from other countries.

The best method of saving the stones, is to let some of the finest peaches of the best kinds hang till they drop off themselves from the tree; and then the stones should be immediately planted on a bed of light rich earth, setting them four inches deep in the earth, and about six inches asunder. The beds should be covered, to preserve them in the winter; and in spring when the trees come up, they must be cleared of weeds, and well watered. The next spring they should be carefully taken up, and planted in the nursery, at greater distances; and after two or three years standing here, they may be removed to the places where they are to remain; or they may, at that time when the condition of their fruit is known, be grafted on other stocks, which is the common way now used to propagate these trees. In order to this, some good stocks should be provided, which should be of the muscle, or white pear-plum. When these stocks are two or three years old, they will be strong enough to bud; and the common season for doing this is about midsummer. The buds should be chosen from a healthy tree, which produces a great deal of fruit: they must be taken from the trees either in a cloudy day, or else in the morning or evening, when the sun has not much power: they should be then inoculated on the stocks as soon as possible, and the stocks treated with the usual care afterwards.

When these are to be transplanted where they are to remain, the most proper soil for them is, a light rich pasture land, taken up with the turf, and rotted together before it is to be used. The borders made with this cannot be too wide, and ought to be raised five or six inches above the level of the ground, and more if the soil is moist. They must be transplanted in autumn, as soon as the leaves are fallen off; and should never be set at less than fourteen feet distance from one another. The heads of the trees are then to be raised up against the walls, to keep the roots from being moved by the wind; and they should be watered at times with a nose on the watering-pot, and the water sprinkled all over them.

In the middle of May the new shoots are to be nailed to the wall, training them horizontally; and the fore-right shoots must be rubbed off. In October the new branches should be pruned, shortening them according to the strength of the tree; if strong, they may be left eight inches long; if weak, they should only be left five; and the same care is to be taken of them for the succeeding years. There are two general rules always to be observed in the pruning of peach and nectarine trees. First, always take care to have enough bearing wood, and secondly not to lay in the branches too close to one another. All peach-trees produce their fruit from the young wood either of the same, or at most of the former year's shoot; for this reason the branches are to be so pruned, as to encourage them to throw out new shoots in every part of the tree. This is the method of the summer pruning.

The winter pruning is usually done in February or March, but the best time is at Michaelmas, as soon as their leaves begin to fall; and the wounds will then have time to heal before the severe frosts come on.

In pruning these trees it should also be observed, that it is best done under a wood bud, not a blossom bud; for if the shoot has not a leading bud where it is cut, it will commonly die down to one.

In nailing the shoots to the wall, they should be placed at as equal distances as possible, and so far apart

that the leaves may have room; and they must always be trained as horizontally as possible, that the lower part of the tree may be well wooded, which it will not be if the branches are suffered to grow upright.

PEAR-TREE, *Pyrus*, a genus of plants, ranged by Linnæus among the *icosandria pentagynia*.

It is a native of Europe, and our gardens afford a great number of varieties of it from culture, of which we shall only mention a few of the best; viz. 1. The little Musk-pear, which ripens in July. 2. The Jargonelle, this is one of the best summer-pears. 3. The Windfor-pear. 4. The Blanquette-pear. 5. The red Orange-pear. 6. The Royal-pear. 7. The Summer-boncretien. 8. The Rouffellet. 9. The Princes-pear. 10. The Summer-bergamot. 11. The Autumn-bergamot. 12. The Brown-beurré. 13. The Monsieur John. 14. The Flowered-muscat. 15. The green Sugar-pear. 16. La Marquise. 17. The Crassan. 18. The Colmar. 19. The Vert-longue. 20. The Virgoulé. 21. The Winter-thorn. 22. The St. Germain. 23. The Winter-rouffellet. 24. The Easter-bergamot. 25. The Hollands-bergamot. 26. The Winter-boncretien. 27. The Chaumontelle. (The following are baking-pears) 28. The Pound-pear, or Black-pear of Worcester. 29. The winter Citron-pear. 30. The Franc-real. 31. The double Flowering-pear, with many other sorts.

Culture of the PEAR-TREE.

They are all propagated by budding or grafting upon stocks of their own kind (commonly called free-stocks) or upon quince-stocks; the latter are used for low walls, dwarfs, or espaliers; and especially in wet lands, these stocks do effectually prevent the too great luxuriance of the plant, and cause it to produce fruit much sooner than on a pear-stock; but then, on the other hand, it has this evil attending it, that the tree is but short-lived, and most of the sorts of hard baking-pears are rendered stony and good for little: on the contrary, most melting soft Pears are greatly improved by being grafted on quince-stocks, particularly if the soil is of a moist strong nature.

The best season to prune Pear-trees is at the fall of the leaf, though it may be deferred till the spring, observing to cut out all luxuriant branches, which are known by the great distance of their buds, and to lay in no more wood than the roots may be reasonably supposed capable of supplying with sufficient juices, leaving them at a distance from each other, in proportion to the size of the fruit; such sorts whose fruit are small may be allowed five or six inches, but the larger ones must be not less than seven or eight inches asunder, always remembering to train the branches horizontally as they are produced, without topping them, by which means there will be little occasion for much pruning these trees; for it appears, that Pear-trees have their bearing-buds in three different states, continually succeeding each other; the blowing-buds of three years old discover themselves at the fall of the leaf, which, whilst the fruit preceding them was growing and ripening, they were preparing to succeed them the ensuing year: these buds are produced upon cursons or spurs, and are known by their being very full and larger than the others, in a seeming swelling impatient state of breaking out into its beautiful dress of delightful bloom, which is enwrapped within it: the preparative buds of two years are of a sharp conic figure, and red russet colour, growing very near the fruitful buds before described: the junior buds of one year are very small, but full above the bark, and always break out near the buds of two years growth: to which may be added, there is a continued succession of buds in embryo, ad infinitum.

The distance Pear-trees should be planted, either against walls or espaliers, should not be less than thirty feet, for if they have not room to spread on each side, it will be impossible to preserve them in good order, especially those on free stocks, for the more these trees are pruned the more they will shoot: many sorts of Pears produce their blossom-buds at the extremity of the shoots;

so that when they are shortened the fruit will be cut away, which cannot be avoided where the trees have not room allowed in their first planting.

The best season for planting Pear-trees in a dry soil is at autumn, but if the land be moist the spring is to be preferred.

PEDICLE, that part of a stalk which immediately sustains a leaf, a flower, or a fruit, and is commonly called a foot-stalk.

PEDUNCLE, signifies the foot-stalk of a flower only, as Pedicle does the foot-stalk of a leaf.

Peduncles are called fastigate, when their lengths are so proportioned that the flowers which they support form an even surface.

PELLITORY of Spain, a species of Chamomile. See the article **CHAMOMILE**.

PENDULOUS FLOWERS, such as hang downward.

PENGUIN, or *Wild PINE-APPLE*. See the article *Wild PINE-APPLE*.

PENNYROYAL, *Pulegium*, according to Linnæus a species of *Mentha* or Mint, but considered as a distinct genus by other botanists.

Culture of the PENNYROYAL.

It propagates itself very fast by its trailing branches, which emit roots at every joint, and striking themselves into the ground send forth new branches; so that no more is required in their culture, than to cut off any of these rooted branches, and plant them out in fresh beds, allowing them at least a foot from plant to plant every way. These plants love a moist, strong soil.

PENTAPETALOUS FLOWERS, such as have five leaves.

PENTAPETES, a genus of plants which has no English name, ranged by Linnæus among the *monadelphia polyandria*; there is only one species of it.

This plant is a native of India, and grows with a pleasing wildness to the height of two or three feet. The root is fibrous. The stalk is ribbed, and of a greyish green, fresher towards the top, and at the bottom often purplish: it is of a firm substance, and sends out many branches. The leaves are numerous and placed irregularly; their colour is a deep but shining green, and their form very singular and handsome; they are broadest at the base, long in proportion to their breadth, jagged deeply and irregularly at the edges, and continued to a very long and slender point. The flowers are very conspicuous; they are large and of a most beautiful bright red: they rise from the bosoms of the leaves on the upper part of the plant, and they have slender foot-stalks; each flower is composed of five large petals, and in its centre fifteen filaments: these in their lower part unite and form a tubular body, and at their tops are crowned with upright pointed antheræ. Beside these, which are the proper and perfect stamina, or filaments of the flower, there are five others, of a peculiar form: they are crooked, and rise from the tubular body formed by the proper stamina, and stand regularly between threes of them. The style is single, and its top or stigma thick.

This singular flower stands in a cup, formed of five slender, rough, long leaves, which are woolly within; and it is succeeded by a hard and almost woody fruit, which holds in several cells a number of flat seeds, edged with membranes.

Culture of the PENTAPETES.

It is propagated by seeds, which should be sown in March upon a hot-bed; and when the plants are fit to transplant, there should be a new hot-bed prepared to receive them, into which should be plunged some small pots filled with good kitchen-garden earth: in each of these let one plant be placed, and give them a little water to settle the earth to their roots; they must also be shaded from the sun till they have taken new root, after which they should be treated in the same manner as other tender exotic plants.

When the plants are grown large enough to fill the pots with their roots, they should be shifted into larger, and plunged into another hot-bed, where they

may remain as long as they can stand under the glasses of the bed without being injured; afterwards they must be removed either into the stove or a glass-case, where they may be screened from the cold, and in warm weather have plenty of fresh air admitted to them.

The plants will flower early in July, and there will be a succession of them till the end of September, during which time they make an elegant appearance. The seeds ripen gradually after each other in the same succession as the flowers were produced, and they should be gathered as soon as the capsules begin to open at the top.

PEONY or PIONY, *Pæonia*, a genus of plants, ranged by Linnæus among the *polyandria digynia*, and of which he distinguishes only one species, which has two varieties, called the Male Peony and the Female Peony, but other botanists enumerate six species of this plant.

There are many varieties of this plant raised from culture, one of the most common, though not less beautiful, among these, is the great Crimson Peony, and one of the most rare is the dwarf Oriental Peony.

Great Crimson PEONY. The root of this plant is long and tuberous, brown on the outside, pale within, and of an unpleasing taste. The leaves are large, and irregularly divided into a multitude of parts, which are oblong, uncut at the edges, obtuse, and of a firm substance: of a full green on the upper side, and pale underneath. The main foot-stalks are of a pale green, and the branches which support the divisions, are often tinged with red. The stalk is round, green, thick, irregularly divided, and two feet and a half high; the leaves on this resemble those from the root, only they have fewer divisions. The flowers are numerous and extremely beautiful: their first appearance is in a vast oval bud, of a deep crimson colour, placed in a small cup formed of five unequal leaves, which are rounded, hollowed, and naturally turn back at the top and sides: this cup remains with the fruit. The bud by degrees, opening several ways, discloses itself in form of a vast specious double flower, composed of innumerable petals, all large, and beautifully stained with a deep crimson, but of various size and shape. The outer petals, or those which rise immediately within the cup, are large and rounded, these are naturally five: the rest which fill the body of the flower are of irregular and uncertain form, some flatted and plain, others waved, curled, and indented at the top: some broad and short, others longer and narrow: some hollow at the base only, others all the way: and not unfrequently there are some which mimic the shape of the leaves of the plant. The whole is stained when the flower is in its plain perfect state, with an uniform deep crimson; but there are many varieties in this respect, some are pale, and some are tinged with a deeper and a paler red, and with white.

Culture of this PEONY.

The third week in August dig up a border two spades deep, in a place where there is a great deal of shade, and some moisture; take some of the off-sets from the root of a thriving plant, let them be large and furnished with good buds: plant four of these in the bed at a yard distance from one another, after which sow on the same spot some seeds saved from a fine strong plant; these will shoot the succeeding spring, and when they are of a size to transplant, they should be removed into a like situation and soil in the nursery, and kept there till they flower. Some will have double flowers, the finest of which should be kept to supply the place of the old roots.

The off-sets should be taken from the parent root every year, to keep the old plants in their beauty; and as they will be small they should be planted out into a nursery bed till they are of a due bigness for flowering with strength, and they must then be planted out in various parts of the garden, always observing to place them in the shade.

Dwarf Oriental PEONY. The root of this plant is tuberous and irregular, composed of numerous, oblong, fleshy parts, connected by long fibres. The leaves are divided in an irregular manner into many segments, and these are of a firm substance: on the upper side they are of

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of a deep blackish green, with white veins, tinged about the base with crimson, and their under side is greyish. The stalk is purple at the base, of a pale green upwards, smooth, round, firm, upright, and ten inches high, usually single, and the support of one flower only. The leaves on it are rarely more than two: they are placed at distances, one near the ground, and the other not much below the flower; these resemble those from the root in colour and in substance: they are also divided at the edges with the same irregularity, and their veins tinged more deeply. The flowers are very large, their colour is sometimes a pale, and at others a beautiful deep crimson, but this often varies from culture.

Culture of this PEONY.

This plant is propagated either by seeds, or by parting of the roots; but the first is the best method. For this purpose let a part of the garden be chosen in an open elevated spot, where rains take their course toward the lower ground, or where the drippings of some eves of a building fall upon a higher spot at a little distance. Here dig out a border; and having removed the earth, throw in the following compost: Mix four parts of rich meadow mould with one part of rotted dung from an old melon-bed: fill the place with this, level the surface, and scatter over it the seeds gathered from a strong growing plant; no matter for the colour. Sift on a quarter of an inch of mould, and throw some bushes over the ground. The plants will rise freely, and will only require the usual care of weeding, and now and then a gentle watering. The succeeding autumn there must be half an inch of fresh meadow-earth, without any mixture, sifted over the whole border, and the next spring the plants will flower: there will be many degrees of colouring among them, and some elegantly painted; the inferior kinds must be taken up the following September, and planted out in other places, and the finer plants left at a foot distance: let the bed be again refreshed in autumn with a new covering of mould, and the next spring will shew their full glory. The mould must be drawn up about their stems as they rise, and frequent gentle waterings must be allowed to swell the flowers.

PEPPER-MINT, a species of Mint. See the article MINT.

Jamaica PEPPER, CLOVE-TREE, or ALL-SPICE, *Caryophyllus*, a genus of plants, of which there are five species. 1. The Clove-tree with oval, spear-shaped leaves, growing opposite, and flowers terminating the stalks, whose stamina are longer than the petals. 2. The All-spice, Pimento, or Jamaica Pepper. 3. Clove-tree, with spear-shaped leaves placed opposite, and flowers growing by pairs from the sides of the stalks. 4. Clove-tree, with oval, blunt leaves placed opposite, and flowers growing thinly from the sides of the branches. 5. Clove-tree, with oblong, oval leaves, which are stiff, smooth, and indented at the edges, and flowers growing in bunches, terminating the stalk.

The first species grows naturally in the Moluccas, and the hottest parts of the world. It is the young fruit beat from these trees before they are half grown, which are the cloves used all over Europe.

The second and third species are natives of Jamaica. The first of these is the tree, the fruit of which is well known by the different appellations of Jamaica Pepper, All-spice, and Pimento.

The fourth species is a native of Carthegena in New Spain, and the fifth grows naturally in the island of Barbuda.

Culture of the Jamaica PEPPER, &c.

The first species is not propagated in this country.

The second, third, fourth, and fifth species are propagated by seeds, but it is difficult to raise the plants here. When the plants come up they should be transplanted into pots filled with a soft loamy earth, and placed in the stove: in winter they must have but little water. In summer a large share of air must be admitted to them, and in July if the season is warm, they may be placed in the open air in a warm sheltered situation, but at the approach of cold nights they must be removed into

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the stove again. When the summer is not warm enough to trust these plants abroad, their leaves should now and then be washed with a sponge to clean them, for they are very subject to contract insects and filth by remaining long in the stove.

If these plants can be obtained from the places where they are native, it will be a much better method than that of raising them from seeds, which seldom succeeds. They are all ever-greens, and their foliage, which is a most beautiful shining green, makes an elegant appearance in the stove at all seasons.

Guinea PEPPER, *Capficum*, a genus of plants, ranged by Linnæus among the *pentandria monogynia*; he enumerates only two species, of which there are many varieties, but other botanists distinguish many more distinct species; those of Linnæus are, 1. Guinea Pepper, with an herbaceous stalk; or the common Indian Pepper. 2. Guinea Pepper, with a shrubby stalk.

The first species is a native of South America, and an annual plant: the fruit of it makes the most wholesome and best pickle in the world.

The second species is a native of Ceylon, it does not appear to have been raised in Europe, which it might be very easily, with only the common care allowed to East-India plants; and its glossy leaf and golden fruit would be a great addition to the variety and beauty of the plants kept in our gardens.

Culture of the Guinea PEPPER.

The first species is one of those plants the gardener must raise on hot-beds in the spring, to plant into his borders in the summer; to do this properly, several hot-beds are required, one to succeed the other: each is to receive the plants which the former have thrown up from seed, or raised to some bigness.

Let the first hot-bed be made ready in February, for the end of that month will be the proper time for sowing the seeds, and take care when sown that they are about three quarters of an inch covered. Common mould does for the first bed, but rotted wood, some decayed leaves, and about one fifth part of sand, should be wrought in with the mould of the second.

When the plants have got some strength, let them be removed into the second hot-bed, planting them three inches deep, and about eight inches asunder, taking care to preserve their roots entire; fill up the holes, and give the plants a gentle watering: they are now to be covered at night, and in the day they are to have air.

In this hot-bed they should stand a month, when they must be removed to a third hot-bed, and from this, after another month, let them be planted into small pots filled with a fine rich compost, as directed for the second bed, and placed in a fourth bed. This fourth and last bed must have a deep frame, and as many pots as can stand by one another must be put into it, and the space between them filled up with earth. While they are in this frame the cover must be more and more raised every day, and after three weeks, taking the advantage of a warm cloudy day, it may be entirely removed: let this be repeated four or five times in such weather, and they will be thus hardened to the air.

In the middle of July they may be planted out into borders, taking all the earth of the pot with them; here they will require gentle waterings from time to time, and with this management they will grow to full perfection.

PEPPERWORT, or DITTANDER. See the article DITTANDER.

PERENNIAL, a term applied to those plants whose roots will abide many years, whether they retain their leaves in winter or not; those which retain their leaves are called ever-greens, but such as cast their leaves are called deciduous, or perdidols. Some of these plants have annual stalks, which die to the root every autumn, and shoot up again in the spring, to which Jungius gives the title of *Radix Raftibilis*.

PERIANTHIUM, a flower-cup situated close to the fructification. It surrounds the lower part of the flower, and consists of several leaves, or of one leaf divided into several segments. If it includes the stamina and not the germen,

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germen, it is the Perianthium of the flower; if the germen but not the stamina, the Perianthium of the fruit: but if it includes both, it is the Perianthium of the fructification. See CALYX.

PERICARPIUM, among botanists, a covering or case for the seeds of plants; it is the germen of the pistil enlarged: there are no less than nine species of pericarpia. 1. A Capsule. 2. A Conceptaculum. 3. A Pod. 4. A Ligumen. 5. A Nut. 6. A Drupe. 7. An Apple. 8. A Berry. 9. A Strobilus.

PERYCLYMENUM, a species of Honeyfuckle. See the article HONEYSUCKLE.

PERIWINKLE, a genus of plants, ranged by Linnaeus among the *pentandria monogynia*, and of which there are three species. 1. Periwinkle, with trailing stalks, and oval, spear-shaped leaves. 2. Periwinkle, with erect stalks, and oval leaves. 3. Periwinkle, with oblong, oval, entire leaves, a very long tube to the flower, and a shrubby stalk.

The last of these species is the only one worthy description.

This beautiful plant is a native of Madagascar. The root is composed of numerous large fibres, connected to an oblong head. The stem is woody, and covered with a brown bark: the young shoots are green, and the plant in its most agreeable form is a slight shrub about a yard high. The leaves, which are very elegant, are placed in pairs; they are oblong, very broad, undivided at the edges, and of a firm substance; their colour is a deep green, their surface glossy, and their veins whitish. The flowers crown all the branches in great tufts at their extremities: they are large, and in the highest degree beautiful, they stand wide expanded, crowding on each other; their colour on the inside is a delicate crimson, and on the out of a pearly white.

The body of the flower is formed of one petal, tubular at the base, and fully expanded at the verge. The tubular part is longer than the cup, cylindric towards the bottom, broader upwards, and marked with five lines: it has also a pentangular mouth. The expanded part is formed of five vast segments: they are broad, obtuse, and so deeply cut down, that they resemble so many petals, but they are united with the top of the tube. The filaments are five: they are very short, bent backward and forward, and crowned with upright, obtuse, membranaceous buttons. There are two rudiments with a roundish gland affixed to each, and to these there is one common style, short and cylindric; this has two heads: the lower rounded and flat, the upper hollow. Two long pods, formed each of a single valve, and opening longitudinally, succeed each flower; the seeds are numerous, oblong, and furrowed.

Culture of the PERIWINKLE.

The first and second species are easily propagated by their trailing stalks, which, after they have taken root, may be cut off and transplanted where they are to remain, and there they will spread very fast without any farther care.

The third species is propagated either by seeds or cuttings. If by seeds, they should be sown upon a moderate hot-bed in the spring; and when the plants are fit to remove, they should be transplanted on a fresh hot-bed at about four inches distance, shading them from the sun till they have taken new root; after which they must be treated in the same manner as other tender plants which are natives of warm countries, but great care must be taken not to draw the plants up weak, nor must they have much water.

When the plants have obtained strength, they must be carefully taken up with balls of earth to their roots, and planted in pots filled with good earth, and plunged into a moderate hot-bed, where they must be shaded from the sun, and when they are well rooted in the pots, they must be gradually inured to bear the open air; but unless the summer proves warm they should not be placed abroad, but set in an airy glass-case, and in winter they must be removed into the stove.

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If these plants are propagated by cuttings, they should be planted in pots during any of the summer months; and plunged into a moderate hot-bed; when they have taken good root they must be gradually hardened, and then transplanted into other pots, and treated in the same manner as the seedling plants.

PERSICARIA, *Arse-smart*, a genus of plants, of which there are several species, but one of these only is worthy a place in our gardens; viz. Great Oriental Persicaria.

This is an erect and very noble plant. The root is fibrous; the stalk is green, round, jointed at distances, in a conspicuous manner, and ten feet high: towards the top it divides into numerous branches, and with good management forms a handsome head. The leaves are large and very beautiful; they have short foot-stalks rising from the joints, under the covert of some slight rough films: they are of an oblong figure, approaching somewhat to oval, broadest at the base, and smaller to the point, waved at the edges, and of a fine green. The flowers grow in long spikes from the tops of the branches, and also from the bosoms of the leaves; they are separately small, but in the spike they are very conspicuous: this, before the flowers open, is of a lively red, with a tinge of crimson; when they are opened the whole looks considerably paler, the buds being much more strongly coloured than the insides of the flowers.

Culture of the PERSICARIA.

It is propagated by seeds, which should be gathered in October, from some large heads of a flourishing plant: spread them upon a papered shelf for ten days, after which they must be sown, scattering half a dozen of the seeds at five or six inches distance from one another, sprinkle over them a very slight covering of mould.

When the young plants are about four inches high, it will be easy to perceive which is the strongest; pull up the rest in each spot, and draw some mould about the stalk of this. As it advances in height, suffer a branch to grow, as there naturally will, from the bottom of each leaf: but if these ramble out too far in length, afterwards shorten them; this will draw some juices to the part, and keep the plants supplied at the joint: the leaf will also be fresh and vigorous, which is a great article. Thus without any farther care the plants left in each spot will grow to its full height, and make a very beautiful appearance.

PETALS, an appellation given to the flower leaves, or those of which the corolla consists, in opposition to the folia or common green leaves of a plant. A corolla is said to be monopetalous when it has a single Petal, dipetalous when it has two Petals, tripetalous when three, and polypetalous when many.

PETER'S-WORT, a species of Honeyfuckle. See the article HONEYSUCKLE.

PETIOLE, the foot-stalk of a leaf, as peduncle is that of a flower. See PEDUNCLE.

PETREA, a genus of plants, of which there is only one species.

This is a shrubby plant, and a native of La Vera Cruz in New Spain. It rises with a woody stalk to the height of sixteen feet. The leaves are stiff, of a light green, and their surface rough. The flowers grow in long, loose bunches at the ends of the branches, and each stands upon a slender foot-stalk. The emblement of the flower is composed of five narrow obtuse leaves, of a beautiful bright blue. The petals are about half the length of the emblement, and quite white.

Culture of the PETREA.

It is propagated by seeds, which must be obtained from the places where the trees grow naturally; these should be sown in a good hot-bed, and when the plants come up they should be each removed into a separate small pot, filled with light, loamy earth, and plunged into a hot-bed of tanners-bark, and afterwards placed in the bark-bed in the stove, where they should constantly remain, and be treated like other plants of the same country.

PHEASANT's-EYE, ADONIS, or FLOS-ADONIS, a genus

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genus of plants, ranged by Linnæus among the *polyandria polyginia*, and of which there are four species. 1. Pheasant's-eye, with eight petals to the flowers, and a somewhat cylindric fruit, commonly called Red Morocco. 2. Pheasant's-eye, with twelve petals to the flowers, and an oval fruit. 3. Pheasant's-eye, with fifteen petals to the flowers, and an oval fruit. 4. Pheasant's-eye, with depressed fruit, and sawed, oval, double trifoliate leaves.

The first species grows naturally among the corn in England, and in other countries in the south of Europe. There are two varieties of it, one of which is cultivated in our gardens.

The second species is a native of Prussia, Bohemia, and some other parts of Germany.

The third species is an elegant plant, and native of Siberia and the Appennine mountains. The root is formed of numerous thick and black fibres, spreading every way, and entangling variously one among another. The first leaves are extremely elegant; their colour is a fine deep green, and their foot-stalks are purple: they are divided in the pinnated manner, and what may be called the pinnæ, or distinct leaves, are oblong, pointed, and have some breadth. The stalk is round, and thick though low: it would be upright, but that the weight of the flowers is too much for its steady support. Where it rises from the ground it is reddish, and there often hang about it a few films of a purplish brown; it is of a pale green upwards, with some tinge of yellow, and it is all the way dusted with little grey transparent globules: these are the extremities of so many round evanescent secretory ducts, as the hairs of other plants are the more permanent extremities of theirs. The leaves on the upper part of the stalk have less breadth, and are more irregularly divided than those at its bottom, but they retain the same tint only fainter. The flower is vast, and when the root has stood to get good strength, and numerous stalks rise from it together, the tuft is crowned with a continued head of them. The bigness of the flower, when the plant thrives perfectly, is that of the largest single Anemone: its colour perfect gold. The cup in which it stands is very beautiful: five elegant oval leaves compose it, and they are of a fine yellowish green. The body of the flower is formed of an uncertain number of petals, usually twelve or thirteen; they are oblong, broad, and irregularly terminated: in the center stand numerous short filaments, they form a thick tuft, and each is topped by an oblong and somewhat crooked button: in the midst stand numerous rudiments of seeds, collected into a kind of head, and on these are placed pointed and bent stigmata, to receive the dust from these numerous buttons. The fruit is of an oval form, and is composed of naked seeds, fixed in five series to an oblong receptacle: their shape is irregular, angulated, and bent at the top.

The root of the fourth species is composed of numerous white fibres, connected to a small head. The first leaves are supported on long, firm, whitish foot-stalks, and each is composed of three parts, each part of three lesser leaves; the natural division of the foot-stalk is thus into three parts, and the natural number of leaves on each of these are three, but sometimes they are in the whole fewer, the two side divisions having only two leaves, and the middle one three. Thus the whole radical leaf, when perfect, consists of nine smaller leaves, when imperfect of seven, and when redundant of thirteen. The separate leaves are of a firm substance, of an oval figure, notched irregularly at the edges, and of a blackish green. The stalk is round, firm, branched, and eight inches high. The larger leaves toward the lower part of this are placed in threes, and are of the same dark green with those from the root; on the upper part of the stalk, and on the branches, they are irregularly placed, and narrow. The flowers terminate all the branches in large numbers, and they are of a faint yellow, with a tinge of green. The cup is composed of five small, oval, hollowed, and fading leaves, of a yellowish colour. The body of the flower is formed of an uncertain number of petals, from five to fifteen, accord-

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ing to the age of the plant: they are obtuse, and stand open; in the midst there are numerous short filaments, and in the middle of these a cluster of rudiment of seeds: these have no styles, but each its proper head, which is pointed and bent back.

Culture of the PHEASANT'S-EYE.

The variety of the first species is propagated by sowing the seeds in autumn, in a light soil, in the borders of the flower-garden: but if the seeds of the plants are permitted to scatter, they generally succeed better than when they are sown.

The second species is propagated by seeds, which should be sown soon after they are ripe. When the plants come up let them be kept weeded and carefully watered in dry weather, and in the autumn following be transplanted to the places in which they are designed to remain.

The third species is propagated either by seeds or parting the roots: either way the gardener should chuse a small spot of ground open to the winds, and where the mid-day sun is in some degree kept off by trees: let him take out the mould here two feet deep, and lay on a thin coat of clay, but not too firmly beaten: upon this let him scatter some large gravel, and then pour in the following compost.

Let him dig out some pasture-land from under the turf on the side of a hill, where the mould is light and mellow, and is accustomed to some settling of wet.

The spot being levelled, will serve either to receive the parted roots from another place, which should be set in the latter end of August, or the seeds. The first way is the easiest, but it is from the other we are to expect the finest plants.

The method by seeds is as follows. When the plants are in flower, let him observe the strongest root, which he will know by the number and height of the shoots. All these must be cut away, except one; and then with a trowel dig up the ground about the plant, and give it once in two days a little water. When the flower has fallen, and the seeds begin to shew themselves of some bigness, let him forbear watering. When they are grown to a full size, and are somewhat hardened, he must carefully cut off the head, and lay it on a papered shelf. When the seeds fall off, they must be wrapped in paper, and kept till the beginning of September; they should then be sown thinly upon the piece of ground prepared for them; and an inch of lighter mould sifted over them: let a few pieces of furze-bush be thrown upon the bed to prevent accidents; and in dry seasons gently refreshed with water. After this, when the plants are up, let some pea-straw be scattered over them in hard weather, and they must be kept clear from weeds. In spring they should be thinned, by taking up the weakest, where they have risen too thick; and let these be planted out into other parts of the garden. Let the others be left at fifteen inches distance every way in the seed-bed, and not removed afterwards. Thus being allowed full room, and kept free from weeds, they will flower in great perfection.

The fourth species is propagated by seeds, which should be sown in February, in a pot of common garden-mould, and raised in a bark-bed. Two or three of the strongest plants must be saved, and planted out in separate pots, and afterwards brought into the stove.

PHEASANT-EYE PINK, a species of Carnation. See the article **CARNATION**.

PHLOX, a genus of plants of which there are nine species; among these the following is one of the most beautiful, and the culture of it is a proper direction for that of all the rest, viz. Phlox with smooth, heart-shaped, and lanceolated leaves.

This plant is perennial, and a native of North-America. The root is composed of innumerable fibres connected to a small head. The stalk is upright, firm, and two feet high, rounded, somewhat rough on the surface, and elegantly spotted. The two colours which form the variegation are red and green; when the plant is in its highest perfection, they are thrown together upon

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upon the stalk in irregular lines, and spots. The leaves are placed in pairs; they are oblong and moderately broad; heart-shaped and largest at the base, where they embrace the stalk, and from thence waved at the edges; somewhat broad again near the middle, and sharp-pointed. Their colour is a fresh green. The flowers are numerous, large, and very beautiful; it is of a pale but delicate red, they are disposed in a great irregular tuft at the extremities of the stalks. Each flower has its cup, this is formed of one piece marked with ten ridges, and cut into five segments at the rim. One petal forms the flower. The tubular part is longer than the cup, narrowest toward the base, and a little bent; the segments of the verge are five, they are large, rounded, and expanded. The filaments are five in number; two are larger, and one is shorter than the other two. Their buttons stand in the opening of the segments. The style is single, and is of the form and length of the filaments, but is crowned with a three-parted head: it rises from a rudiment of a conic form, which ripens into an oval capsule, marked with three ridges, formed of three valves, and divided within into three cells, in each of which is an oval seed.

Culture of the PHLOX.

The best method of propagating this plant is by cuttings, which should be planted in a bed of fresh rich mould, dug up for it in the nursery, and must be duly watered till they have taken root. The best season for planting them is the middle of May: they will be rooted towards the end of June, and they must remain in their places till October, then let them be removed into their places in the borders, and the ground must be kept clear about them for a foot and a half every way: this promotes the spreading of their fibres, and on this depends the perfection of their flowers.

PHYLICA, a genus of plants, ranged by Linnæus among the *pentandria monogynia*, and of which there are three species. 1. Phyllica, with linear leaves growing in whorls. 2. Phyllica, with narrow, awl-shaped leaves, hairy at the top. 3. Phyllica, with oval, scattered leaves.

These are shrubby plants, natives of Ethiopia, and all require the same culture. The first of the species is the most beautiful.

It is about a yard high. The main stem is covered with a brown bark, and the young twigs are purplish. The leaves are small and numerous: they grow in a kind of circular clusters round the stalk, they are narrow, sharp-pointed, and of a firm substance; their colour on the upper side is a fine green, and on the lower they are silvery. The flowers are very small and white. From the top of the branches, and from their sides, there rise slender shoots two or three inches long, beset with numerous leaves, and crowned with clusters of flowers: each stands in its separate cup, which is composed of three narrow and sharp-pointed segments: this remains when the flower is fallen and becomes the defence of a roundish seed-vessel, marked with three ridges, and containing in as many cells, three roundish seeds, one in each. In the center of the flower, which is tubular at the base, and divided into five small segments at the rim, there rise five very small filaments. At the base of every segment of the flower there stands a little scale: these are five in all, they are sharp-pointed, and they converge inwards: the five filaments have their insertion under these five scales, one rising under each, and they are terminated by small, roundish buttons; the style is placed among these, and is small and undivided.

Culture of the PHYLICA.

This plant is propagated by cuttings, which thrive best in the following compost:

Take a barrow of earth from an upland pasture, half a barrow of garden-mould, a bushel of sand, and half a bushel of saw-dust: these must be well worked together in the spring, and lie mellowing all summer.

In the beginning of the succeeding autumn fill a pot with this large enough to hold ten or twelve of the cuttings, which must be taken from a thriving plant, and set in with great care, observing to give them frequent and gentle waterings; the pots must be set up to

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the rim in an old bark-bed, and the plants shaded with mats. With this management they will soon take root, after which they may be treated in the same manner as other green-house plants.

PIMENTO. See the article *Jamaica PEPPER*.

PIMPERNEL, *Anagalis*, a genus of plants, ranged by Linnæus among the *pentandria monogynia*, and of which there are four species. 1. Pimpernel, with undivided leaves, and a trailing stalk; or the common red Pimpernel. 2. Pimpernel, with undivided leaves, and an erect stalk; or the blue Pimpernel. 3. Pimpernel, with heart-shaped leaves embracing the stalks, and compressed stalks. 4. Pimpernel, with sinuated leaves.

These are all annual plants. The first species is a native of this country, and most others in Europe. The native place of the second species is not known. The third grows naturally in Spain; and the fourth at the Cape of Good Hope.

Culture of the PIMPERNEL.

All the species are propagated by seeds, which should be sown soon after they are ripe. When the plants come up they only require to be kept clear of weeds; and the third and fourth species must be sheltered from extreme cold.

PINE-APPLE, *Ananas*, a genus of plants, ranged by Linnæus among the *hexandria monogynia*, and according to him a species of the *Bromelia*, but considered by other authors as a distinct genus.

This plant is robust, and rises to the height of two feet and a half. The root is thick and sends out many scattered fibres. The leaves are long and narrow, sharp-pointed, and of a pale green, with a tinge of blue. In the center of the cluster of leaves rises the stalk, round, thick, and of a pale green, with two or three little leaves upon it. On its top is placed an oval, pyramidal, fleshy substance, formed of many clustered tubercles supporting the flowers, which are of a beautiful crimson: this, at its first appearance, is green, and in one of the varieties continues so when ripe, at which time in some of these varieties it is oval, in others roundish, and in others pointed: in some the flesh is white, in others yellow. On the summit stands a crown of clustered leaves, like those of the plant, and of an elegant blue green. This crown grows in proportion with the fruit, which, when ripe, changes to a bright straw-colour. While it continues to grow, it shoots out on all sides, spines or prickles, which, as it approaches towards maturity, dry and soften, so that the fruit is gathered without the least inconveniency.

There are several varieties of this plant, but the five following are the principal. 1. The oval Pine-apple, with white flesh. 2. The pyramidal kind, with yellow flesh. 3. The shining-leaved kind, with scarce any spines on its edges. 4. The pyramidal olive coloured kind, with yellow flesh.

Culture of the PINE-APPLE, according to Mr. Miller.

These plants are propagated by planting the crowns which grow on the fruit, or the suckers which are produced either from the plants, or under the fruit, either of which I have found to be equally good; although, by some persons, the crown is thought preferable to the suckers, as supposing it will produce fruit sooner than the suckers, which is certainly a mistake; for by constant experience I find the suckers (if equally strong) will fruit as soon, and produce as large fruit as the crowns.

The suckers and crowns must be laid to dry in a warm place for four or five days, or more (according to the moisture of the part which adhered to the old plant or fruit) for, if they are immediately planted, they will rot. The certain rule of judging when they are fit to plant, is by observing if the bottom is healed over, and become hard; for, if the suckers are drawn off carefully from the old plants, they will have a hard skin over the lower part; so need not lie so long as those which by accident may have been broken. But whenever a crown is taken from the fruit, or the suckers from the old plants, they should be immediately divested of their bottom leaves, so high as to allow depth for their planting; so that they may be thoroughly dry and healed in every part, left, when

when they receive heat and moisture, they should perish, which often happens when this method is not pursued. If these suckers or crowns are taken off late in the autumn, or during the winter, or early in the spring, they should be laid in a dry place in the stove, for a fortnight or three weeks before they are planted; but in the summer-season they will be fit for planting in three or four days.

As to the earth in which these should be planted, if you have a rich good kitchen-garden mould, not too heavy, so as to detain the moisture too long, nor over light and sandy, it will be very proper for them without any mixture: but, where this is wanting, you should procure some fresh earth from a good pasture, which should be mixed with about a third part of rotten neats-dung, or the dung of an old melon or cucumber-bed, which is well consumed. These should be mixed six or eight months at least before they are used; but if it be a year, it will be the better; and should be often turned, that their parts may be the better united, as also the clods well broken. This earth should not be screened very fine; for, if you only clear it of the great stones, it will be better for the plants than when it is made too fine. You should always avoid mixing any sand with the earth, unless it be extremely stiff; and then it will be necessary to have it mixed at least six months or a year before it is used; and it must be frequently turned, that the sand may be incorporated in the earth, so as to divide its parts: but you should not put more than a sixth part of sand; for too much sand is very injurious to these plants.

In the summer season, when the weather is warm, these plants must be frequently watered; but you should not give them large quantities at a time. You must also be very careful that the moisture is not detained in the pots by the holes being stopped; for that will soon destroy the plants. If the season is warm, they should be watered every other day; but, in a cool season, twice a week will be often enough: and, during the summer season, you should once a week water them gently all over their leaves, which will wash the filth off them, and thereby greatly promote the growth of the plants. There are some persons who frequently shift these plants from pot to pot; but this is by no means to be practised by those who propose to have large well-flavoured fruit; for, unless the pots be filled with the roots, by the time the plants begin to shew their fruit, they commonly produce small fruit, which have generally large crowns on them; so that the plants will not require to be new potted oftener than twice in a season; the first time should be about the end of April, when the suckers and crowns of the former year's fruit (which remained all the winter in those pots in which they were first planted) should be shifted into large pots, *i. e.* those which were in half-penny or three farthings pots, should be put into penny, or at most three halfpenny pots, according to the size of the plants; for you must be very careful not to over-pot them, nothing being more prejudicial to these plants. The second time for shifting them is towards the latter end of August, or the beginning of September, when you should shift those plants which are of a proper size for fruiting the following spring into two-penny pots, which are full large enough for any of those plants. At each of these times of shifting the plants, the bark-bed should be stirred up, and some new bark added, to raise the bed up to the height it was at first made; and, when the pots are plunged again into the bark-bed, the plants should be watered gently all over the leaves, to wash off the filth, and to settle the earth to the roots of the plants. If the bark-bed be well stirred, and a quantity of good fresh bark added to the bed, at this latter shifting it will be of great service to the plants; and they may remain in the tan until the beginning of November, or sometimes later, according to the mildness of the season, and will not require any fire before that time. During the winter season these plants will not require to be watered oftener than every third or fourth day, according as you find the earth in the pots to dry: nor should you give them too much at a time; for it is much better to give

them a little water often, than to over-water them, especially at that season. You must observe never to shift those plants which shew their fruit into other pots: for, if they are removed after the fruit appears, it will stop the growth, and thereby cause the fruit to be smaller, and retard its ripening; so that many times it will be October or November before the fruit is ripe: therefore you should be very careful to keep the plants in a vigorous growing state from the first appearance of the fruit, because upon this depends the goodness and size of the fruit; for, if they receive a check after this, the fruit is generally small and ill-tasted.

The method of judging when the fruit is ripe, is by the smell, and from observation; for, as the several sorts differ from each other in the colour of their fruit, that will not be any direction when to cut them; nor should they remain so long as to become flat and dead, as they also do when they are cut long before they are eaten: therefore, the surest way to have this fruit in perfection, is to cut it the same day it is eaten: but it must be early in the morning, before the sun has heated the fruit, observing to cut the stalk as long to the fruit as possible, and lay it in a cool, but dry place, preserving the stalk and crown to it, until it is eaten.

Culture of the PINE-APPLE, according to Dr. Hill.

The two first requisites for cultivating these plants are a bark-bed covered with a frame and glasses, and a stove with its bark-pit. The first serves to raise the suckers and crowns to a condition of bearing fruit; and the second is for bringing their fruit to perfection.

These are to be conducted in the following manner:

Let the frame over the bark-pit be built with brick-work, and have flues to warm the air in winter; let its length and breadth be according to the quantity of plants intended to be raised, and the bigness of the stove to be supplied from it: but let the depth be so much, that the glass covering may be three inches above the height of the tallest plants that need be kept in it, and the whole built firm and sound.

Let the gardener observe to order the bed to be something larger than the common custom, in proportion to the quantity of the plants; for however little the present practice seems sensible of it, the giving the plants room in their infant bed, is the original principle on which the largeness of the fruit depends. The stove should be built with glasses a yard and half high in front, and it should be two yards high at the back. From the top behind to the top of the front glasses, should be carried a covering of glass, sloping, and within is to be the tan-bed.

With respect of the bigness, it must be suited to the quantity of plants intended to be raised: a tan-pit of thirty feet long, and seven broad, will conveniently hold a hundred, and the glass and brick-work must be contrived to surround and cover it. The stove and frame being thus suited to one another, and in readiness; the compost for the plant is next to be considered. There have been various kinds employed, but the best is this.

Mix together one load of rich light mould from under the turf in a pasture, half a load of river-mud, half a load of rotted dung from an old melon-bed, and two bushels of fine pit-sand, with the same quantity of old cow-dung: let these be very well united by stirring, and then thrown up in a ridge, to receive the influence of the air.

When the brick-work is dry and hardened, and the mould and other ingredients in this compost are well blended and enriched by frequent turning to the air with a new surface, all will be ready for beginning the plantation: this is to be made with the crowns taken from the ripe fruit, with the suckers from plants in our own stoves, or from plants brought from America.

The latter method is uncertain, and there is a plain objection against it, which is there being no security of having a good kind. The sugar-loaf sort, whose leaves are streaked on the inside with purple; or the Montserrat kind, whose leaves are entirely purple or brown within, are to be preferred to all others.

The crowns of these, when cut in England, are always ready; and as soon as the fruit is cut, provision should be made for suckers, by cutting the leaves of the plant, taking off the earth from the surface, putting in fresh from the bed of compost, and setting the pot up to the rim in a good hot-bed; it is here to be watered every evening with water that has stood in the stove: and vegetation being thus promoted, when the stalk is cut away, the effort of nature will all be upon the making shoots of suckers, which will serve for the new plantation.

If the plants be procured from America, let them be soaked in a strong decoction of wood-foot and tobacco, to destroy the insects, with which they commonly are loaded, and which will destroy them, and spread over every thing else in the stove, if not killed at first in this manner. If the plantation be made in the more usual way, from crowns and suckers of our own produce, there requires a great deal of care, though of another kind.

Let the crown be taken off from the fruit very gently, and the suckers drawn away with such caution, as not to break the membrane that naturally surrounds them: let the lower leaves be taken off, and let both be laid upon a shelf in a warm room, till the bottoms are dry and hardened: for if planted while wet, they will rot.

Let the gardener take this practical caution, that the suckers, if carefully drawn off, will be fit for planting much sooner than the crowns; in general, three, four, or five days lying will do in summer, but in winter they take ten days, and will not dry well any where but in the stove.

When the bottoms are firm and fit for planting, let the gardener put some of his compost into as many small pots as he has crowns and suckers: he must carefully plant one in each pot, and pouring in more compost, fix it well; and when all are thus planted, let them be set in the bark-bed, observing that the bark is of a moderate degree of heat, and setting the pots in the bark up to the rim, and at a small distance. They are to be kept here during the summer, without any farther heat than that of the bark: and in winter, with the help of a gentle warmth; they must be watered gently every fourth day in summer, and every sixth in winter.

In the April following they will be fit for putting into large pots, which must be done with great care, shaking out the plant with its ball of earth entire, and filling it up with more of the compost. After this they are to be kept in the same manner till the end of July, and then removed once more into larger pots; these should not be too large, for such crowd the bed, and rather injure than help the plants. At each time of shifting, the bark-bed must be stirred up, and some fresh bark added: the plants must then be set in again, and gently watered, and after this preserved in every respect as at first.

When they shew their fruit, the gardener must observe to remove them no more out of their pots, for this can never be done without giving them a check: and if they receive any when they are set for fruit, it will render that fruit small and ill-tasted.

The plants should only be taken out of the tan-bed to the stove when they are in a condition of bearing, and in this manner the stove will always at the proper fruit season, which is from June to the beginning of October, make a very glorious figure, the whole being fruiting plants.

As the fruit are cut, the pots are to be removed and managed for the producing of suckers, as already directed in the bark-bed, of which nothing need be done or seen in the stove. This is the best way of managing the plants: and notwithstanding the second fire that is necessary in winter for the bark-bed, it is in the end the cheapest.

For those who chuse to do otherwise, the bark-bed may be made in the common way, without any convenience for firing. In that case, the plants must be removed into the stove at the approach of winter, and taken out again in spring. The time for planting depends upon the ripening of the fruit, from which the

crown is taken, or from whose root, after cutting, the suckers are raised; so that no week or month can be allotted, but they must be taken when ready.

At the time of planting and removing them into large pots, let there be always a few stones put in the pot over the hole for the discharge of water; that it may always keep open: for if it should fill up, and the wet be detained, it would certainly rot the plant. What the gardener understands by a three-farthing pot is the full bigness for planting the suckers and crowns at first, and for many of them a halfpenny pot will do. The first removal should be into penny pots or three-halfpenny ones, according to their size: and the last into two-penny pots, these being the fittest size for the fruiting plants.

The two dangers to which these plants are exposed, while the due degree of heat is allowed them, is to be destroyed by insects, or choaked for want of air. The insects must be washed off with a sponge, dipped in a decoction of wood-foot and tobacco; and the other accident is to be prevented by raising the glasses in the middle of the day with a notched stick.

The degree of heat when fires are employed, is perfectly to be regulated by the thermometers made for that purpose, and marked with the name of the plant at the due degree. It is impossible to keep the heat always to this exact line: but if the gardener takes care never to let it rise above four or five degrees higher, or fall four or five degrees lower than the mark, he will never hurt his plants.

Culture of the PINE-APPLE, according to the late Mr. Allen.

Let the Pine-apple plants be planted as soon as possible, in pots of about eight or nine inches in diameter, and plunged into a bed of tanners bark, about three feet and a half thick; and let the last half foot on the top of the bed be old tan that has lost its heat, which will prevent the plants being scorched at the roots. In September shift them into large pots with all the earth about them: at the same time shaking up the tan to the bottom of the pit, adding some fresh to keep it up to its proper height; still observing to keep about six inches of old tan at the top. This will be sufficient to keep them till they shew their fruit, which will probably be in February or March; when being prepared with a bed of fresh tan, cover it over about two inches thick with earth; then turn the plants out of the pots, without disturbing the roots, and place them on the bed at proper distances, filling up the interstices with good earth; where they may remain till the fruit is ripe: water them about twice a week all over the bed, but not on the fruit.

There may be a few objections raised against this method, the principal of which is, That those plants which do not shew when they are turned out of the pots, there is a great probability of their passing the summer without fruiting; or, if there should be any that ripen late, the house cannot be at liberty to receive the plants for the succeeding year; and if it is all new tan, as proposed, it is apt to cake and want fresh stirring when the fruit is three parts grown, in order to swell the fruit out to a large size.

There are two sorts of the Ananas principally cultivated in England; one called the Queen-pine, the other the Montserrat. The Queen is most esteemed among the gardeners, as being more regular and certain in their bearing; whereas the Montserrat sort frequently miss the proper season; and many that are brought from that island, though fine plants to look at, are apt to produce but trifling fruit. One cause of this, perhaps, may be, the ill choice that is made in promiscuously taking the suckers from the plants that have produced indifferent fruit.

It generally happens that Pine plants which are brought from the West Indies, have a white insect adhering to them, and which, if not destroyed, may infect a whole house of plants to their great prejudice, as they never thrive while these insects prey on them. Some gardeners infuse the plants in tobacco water, in order to destroy these insects, but this often rots the plants: a much

better method is, when the plants arrive, to strip the small leaves from the roots, and clean them dry; for it is in that part these insects mostly harbour. While the bottoms of the plants are hardening, make a hot-bed with dung, and lay seven or eight inches of old tan on it, which cover with glasses. When the violence of the heat is a little abated, stick the plants in the tan, and let them remain there about three weeks; by which time they will be fit for potting, and the insects entirely destroyed by the steam of the dung. As for plants that do not immediately come from abroad, they are never troubled with these insects, unless the waterings have been neglected, or the plants by some other means are become unhealthy; for they will not prey upon any perfectly healthful plant.

The following Estimate of the Expence of building a Stove for raising PINE-APPLES; together with the annual Charges for Tan, Labour, &c. appeared in the Museum Rusticum, Vol. III. Pag. 142.

A stove, forty feet long, and twelve wide, is the proper size for one fire-place, and contains as much air as one fire will properly warm: I shall therefore calculate my expences for one of that size, and particularly as it will produce about one hundred and fifty pines a year, which is fruit enough for a moderate-sized family.

The height in front is three feet, and the back part about seven feet.

The front, one end, and roof to be of glass, the other end brick, where should be a room about twelve feet square, and it ought not to be less, for the convenience of laying the fuel, and for making the fire.

As to the dimensions of the flues, &c. it is not necessary here to insert them; but I will beg leave to refer any gentleman, who wants to build one, to that ingenious bricklayer, Mr. Salter Field, of Walton upon Thames, who has shewed great skill and judgment in building several.

The expence of building such a stove will be about eighty pounds, supposing all the materials to be new, and at the prices given in London and its neighbourhood; but if you have the conveniency of a wall ready built to erect it against, it will save about fifteen pounds.

The price of the plants will be according to their sizes, from two or three shillings each to ten or twelve, and entirely depends on how long you will wait for fruit, and whether you will buy such as will produce fruit of only one pound weight each, or two or three pounds; but about fifty pounds will stock it properly at first, to have fruit immediately.

The yearly Expences as follows.

	l.	s.	d.
Eight hundred bushels of tan to fill the pit at first, at three half-pence per bushel	5	0	0
Sixteen loads carriage	0	16	0
Three chaldrons and a half of coals, at thirty-six shillings per chaldron	6	6	0
Two hundred bushels of tan more, to keep the bed level with its former height, at three half-pence per bushel	1	5	0
Four loads carriage	0	4	0
Filling the pit with tan, and planting the pots, two days, two men, at two shillings a day each	0	8	0
Stirring the tan up, and adding fresh four times more, at ditto	1	12	0
The time in attending the fires, watering, &c. is worth at the most eighteen-pence a week, which comes to	3	18	0
Repairing the windows, painting, and white-washing	1	11	0
Total	21	0	0

The Pine-apple may also be raised without the help of a stove in a hot-bed of tanners-bark, with the frame we have already described under the article HOT-BED. But as these plants continue for a time in the bed, the heat of which will decay in a few months, it will be neces-

sary to have two of these beds contiguous to one another; and if the frame be made to slide from one bed to the other, it will be sufficient to answer the purpose, otherwise there must be a frame for each. By the help of this additional hot-bed the plants may be kept in the same degree of warmth, by removing them from one bed to the other. But it will not be necessary to remove them as soon as the heat begins to decay in the first bed; because it may be renewed by making a good lining of horse-dung, as is commonly practised in raising cucumbers and melons. By this means the heat of the first bed may be continued a very considerable time; and when it begins to decay, the second bed must be ready for the reception of the plants; and after a proper time the first new made. By this method of removing the plants from one bed to the other, they will always have a proper degree of heat, and will produce fruit equal to any raised in the stoves. But the utmost care must be taken to give the plants as much air as possible; for nothing so much contributes to their growth, and preserving them in a healthy state, as fresh air; nor is any thing more destructive to them, than the putrid confined air of a hot-bed. If you have not the convenience of procuring a sufficient quantity of tanners-bark; the bed may be made with horse-dung, provided the surface of the dung be covered with bark for the reception of the pots.

By this simple method, and observing the directions given in the preceding part of this article, with regard to the compost, and the management of the plants, very fine Pine-apples may be raised at a very small expence.

PINE-TREE, *Pinus*, a genus of plants ranged by Linnæus among the *monoecia monadelphia*. There are several species of it, the two following of which are the best worth cultivating, viz. Pine-tree with two short grey leaves proceeding out of each sheath, and small acute-pointed cones; called Scotch Pine, or Fir. 2. Pine-tree with five rough leaves in each sheath; commonly called Lord Weymouth's Pine.

The first species is a native of the mountains of Scotland, and is common in most parts of Europe; and the second grows naturally in North America, where it is called the white Pine.

Culture of the PINE-TREE.

These and all other species of the Pine-tree, are propagated by seeds. The ripe cones of these trees are either to be exposed to a gentle heat, or soaked for twelve hours in warm water; after which the several cells will open, and the seeds fall out. These seeds must never be taken out till the time of sowing them, which is March. The ground they are to be sown in, must be carefully turned several times, to destroy the roots of weeds. For a large plantation, the best method is to plough it several times; after this the earth should be levelled with a spade in small spots at every six feet square; in each of which spots, ten or twelve seeds are to be sown, and covered with some of the same mould broken fine; they are then to be covered with a furze-bush, or other such covering; and this is to remain for some time after the plants are come up, but care must be taken not to cover them too close; when this is taken off, a little loose earth is to be drawn about the stems of the plants, and some furze stuck about them to keep off the too great heat of the sun. There are usually from twelve seeds eight plants, and these may be left standing together till the third year.

In March or April, the third year after sowing, the plants are to be removed to the place where they are to stand, and planted at eight feet square distance, or greater if desired. Two plants must always be left in each cluster, and great care taken not to injure the roots of them. The others must be taken up with as much earth about their roots as possible. When they are set in the new plantation, there must be stakes fixed near them to tie them to, so as to prevent the wind from blowing them down, and the roots must be covered with litter, and have a gentle watering to settle the earth

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earth to their roots. If the weather should prove very dry, this may be repeated two or three times, but a little at a time; over-watering kills all new-set trees, and the cutting any of the heads or branches of the resinous kinds is a very dangerous thing. The Scotch Pine delights in a chalky soil on the side of a hill, but will also grow in gravel, and in any ground that is not too wet.

The common fir loves a loamy strong soil, and is a native of low flat grounds; and most of the American firs and Pines love a loose moist soil. The silver fir, and the manured Pine, love a dry situation, but must have a deeper soil than the Scotch Pine, and must be sheltered from the north winds. The two trees left in each spot of the place where they were sown, may be left together seven years, then the least flourishing tree is to be carefully removed.

PINK, a species of the carnation. There are many varieties of the Pink now cultivated in the gardens, *viz.* The Damask-Pink, the White-Shock, the Pheasant's-eye with double and single flowers, the common red Pink, Cob's Pink, Dobson's Pink, white Cob Pink, and Bat's Pink.

Culture of the PINK.

The common Pinks are propagated either by seeds, which is the way to obtain new varieties, or by making layers of them, or by planting slips.

If they are propagated by seeds, those of the best sort should be sown in the spring, and the plants treated in the same manner as directed for the Carnation, with this difference only, that as the Pinks are less tender, so they may be more hardily treated; those which are propagated by layers, must also be managed as the Carnation.

The best time to plant the slips of Pinks is about the end of July; and if the weather should prove very dry they must be constantly watered every other day, till they have taken root. These should be planted in a shady border, and the ground well dug, and soaked with water a few hours before the slips are planted; they must be planted at about the distance of three inches square; the ground should be closed very hard about them, and they must be well watered till the cuttings have taken root; after which they will require no other care, but to keep them clear from weeds till autumn, when they should be transplanted to the borders of the flower-garden, where they are designed to remain.

PIONY, or **PEONY**. See the article **PEONY**.

PIPE-TREE, *Syringa*. See the article **SYRINGA**.

PIPPERIDGE-PUSH, or **BERBERRY-TREE**. See the article **BERBERRY-TREE**.

PISHAMIN, or **PERSIMON**, a species of *Diospyros*; and is sometimes called the Pitchumon Plum.

This tree is a native of America, where it rises to the height of twelve or fourteen feet, bearing a fruit which the inhabitants keep till rotten before they eat it, as is practised by medlars in England.

Culture of the PISHAMIN.

This tree is propagated in the same manner as the **INDIAN DATE PLUM**, to which article we refer the reader.

PISONIA. See the article **FINGRIGO**.

PISTACIA, the name of a genus of plants, which comprehends the Pistacia Nut-tree, the Turpentine-tree, and the Mastick-tree; ranged by Linnæus among the *dioecia pentandria*, and of which he distinguishes only the six following species, but other authors enumerate nine: 1. Pistacia with trifoliate leaves. 2. Pistacia with winged, trifoliate, and almost round leaves. 3. Pistacia with unequal winged leaves, the lobes of which are somewhat oval, and recurved, being the Pistacia tree. 4. Pistacia, with unequal, winged leaves; the lobes of which are oval and spear-shaped, or the Terebinthus, or common Turpentine-tree. 5. Pistacia, with abrupt, winged leaves, and spear-shaped lobes, or the Lentuscus, or common Mastick-tree. 6. Pistacia, with winged, deciduous leaves, the lobes of which are oval.

All these species are shrubby plants. The first species is a native of Sicily; the second grows naturally in the

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south of France; the third in Persia, Arabia, Syria, and India; the fourth in the southern parts of Europe, in the northern parts of Africa, and India; the fifth is a native of Spain, Portugal, and Italy; and the sixth is a native of Jamaica.

Culture of the PISTACIA.

The four first species are propagated by the nuts, which should be sown in pots, filled with light kitchen-garden mould, and plunged into a moderate hot-bed, to bring up the plants; which, when they appear, should have a large share of air admitted to them, and by degrees be hardened to bear the open air, to which they are to be exposed about the beginning of June. In autumn they should be placed under a hot-bed frame.

In the spring, before the plants begin to shoot, let them be transplanted each into a separate pot, and as soon as they begin to shoot, they must be gradually hardened, and placed abroad. They may thus be kept in pots four or five years, till they have acquired strength, during which time they should be sheltered in winter; after this they may be turned out of the pots, and planted in the full ground in a sheltered situation. They flower and produce fruit in this country, but the fruit never ripens.

The fifth species is propagated by laying down the young branches; which, when they have put out roots, should be cut off from the old plants, and each transplanted into separate small pots; in winter they must be sheltered, and in summer placed abroad in a warm situation, and managed in the same manner as other hardy kinds of green-house plants. It may also be propagated by seeds in the manner directed for the preceding sorts.

The seeds of the sixth species must be sown in pots filled with light fresh earth, and plunged into a good hot-bed of tanners-bark; when the plants are come up fit to remove, they should be each planted in a separate small pot, and plunged into a fresh hot-bed. In autumn they should be removed into the stove, and placed in the tan-bed: during winter they should have but little water, especially if they cast their leaves, which they generally do after the first winter.

These plants must constantly remain in the stove; admitting a large quantity of air to them in warm weather.

PISTIL, *Pistillum*, among botanists, denotes the female organ of generation in flowers, and is defined, by Linnæus, as an entrail of the plant, designed for the reception of the farina, or male-dust, wherewith it becomes impregnated; it consists of three parts, *viz.* the germen, style, and stigma; the germen is the rudiment of the fruit, accompanying the flower, and is of various shapes, but always situated below the style, or stigma, and contains the embryo seeds; the style is the part that serves to elevate the stigma from the germen, and is also of different forms; the stygma, which is of various shapes likewise, is always placed on the top of the style, or, if that be wanting, on the top of the germen; this part is covered with a moisture, for the breaking of the farina into more minute parts.

PISTOLOESIA, a species of Birthwort. See the article **BIRTHWORT**.

PITCH-TREE, a species of the Fir-tree. See the article **FIR-TREE**.

PITCHUMON PLUM. See the article **PISHAMIN**.

PITH, in vegetation, the soft spongy substance contained in the central parts of plants and trees.

As the substance of the trunk in trees, says Boerhaave, become more woody, the pith is compressed and straightened to such a degree, that it wholly disappears. It is plain from this, that the office of the pith in vegetation cannot be very great, since it is not of perpetual duration. By its spongy structure, it seems fitted to receive any superfluous moisture, that might transude through the pores of the woody fibres. If by the excess of such moisture, or from any other cause, it happens to rot and perish, as frequently happens in elms, the tree

is found to grow full as well without it; a proof it is of no essential use in vegetation.

PLAIN-TREE, *Musa*, a genus of plants of which there are two species. 1. The Plain-tree. 2. The Banana.

The first species is cultivated in all the West Indian islands; it rises with a soft herbaceous stalk fifteen feet high, and upwards; the lower part is eight or nine inches diameter, diminishing gradually to the top, where the leaves come out on every side; these are often six feet long, and near two feet broad, having a strong fleshy mid-rib, and a great number of transverse veins running from it toward the edges: these leaves come out from the center of the stalk, and are rolled up at their first appearance; but when they are advanced above the stalk, they expand quite flat and turn backwards: when the plant is grown to its full height, the flowers will appear in spikes in the center, which are often four feet in length; on the lower part of the spike they are largest, diminishing in their size upwards; each of these spikes is covered with a sheath of a fine purple colour within side, which drops off when the flowers open: the upper part of the spike is covered with barren flowers, which fall off with their covers. The fruit is about eight or nine inches long, and above an inch in diameter, having three blunt angles, and is a little incurved; it is at first green, but when ripe, of a pale yellow colour; the skin is tough, and within is a soft pulp of a luscious sweet flavour: the spikes of fruit are often so large, as to weigh upwards of forty pounds each.

The fruit in the West Indies is generally cut before it is ripe, and roasted in the embers, and eaten by the negroes as bread. The leaves are used for napkins and table-cloths, and are likewise food for hogs.

The second species differs from the first, in having its stalks marked with dark purple stripes and spots. The fruit is rounder, and of a more luscious taste.

Culture of the PLAIN-TREE.

Both these species are propagated by suckers, which should be carefully taken off while young, preserving some fibres to their roots, and planted in pots filled with light rich earth, and plunged into the tan-bed in the stove. This may be done any time in the summer.

When they have been some time in the pots, shake them out, with the ball of earth to their roots, and plant them into the tan-bed in the stove, laying a little old tan near their roots, for their fibres to strike into.

When the bark-bed wants to be renewed with fresh tan, there should be great care taken not to injure the roots of these plants, and a large quantity of the old tan should be left about them; for the new tan, if laid too near them, will scorch their roots.

During the summer season these plants must be plentifully watered; and in winter it must be given them often, but in small quantities.

The stoves for them should be at least twenty feet in height, otherwise there will not be room for their leaves to expand.

PLANE-TREE, *Platanus*, a genus of plants, ranged by Linnaeus among the *monoecia polyandria*, and of which there are only two species. 1. Plane-tree, with hand-shaped leaves. 2. Plane-tree, with lobated leaves.

The first species grows naturally in many parts of Asia, where it rises to a very great size; the stem is tall, erect, and covered with a smooth bark, which annually falls off; it sends forth many side branches, which are generally a little crooked at their joints: the bark of the young branches is of a dark brown, inclining to a purple colour; these are furnished with leaves placed alternately, their foot-stalks are an inch and a half long, the leaves are seven inches long, and eight broad, deeply cut into five segments, and the two outer are slightly cut again into two more; these segments have many acute indentures on their edges, and have each a strong mid-rib, with many lateral veins running to the sides; the upper sides of the leaves are of a deep green, and the under pale. The flowers come out upon long foot-stalks, or ropes, hanging downward, each sustaining five or six

round balls of minute flowers; they come out at the same time as the leaves; and in warm summers the seeds ripen late in autumn, and if left on the trees will remain till spring, when the balls fall to pieces, and the brittly down which surrounds the seeds helps to transport them to a great distance with the wind.

The second species is a native of North America; this tree also arrives to a great size; the foot-stalks are longer and the leaves larger than the other sort; they have several acute indentures on their borders, and are cut into three lobes or angles; the flowers grow in round balls, like the former, but are smaller.

There are also two other sorts, called the Maple-leaved Plane, and the Spanish Plane-tree, somewhat differing from the others in foliage.

The oriental sort was introduced into Italy in the early times of the Romans; their greatest men took much pleasure at their villas, which were surrounded with Plane-trees. Pliny affirms, that there was no tree whatsoever which so well defends from the heat of the sun in summer, nor more kindly admits it in winter, than this plant, the branches being produced at a proportionable distance to the largeness of their leaves; so that when the leaves are fallen in winter, the branches very easily admit the rays of the sun. And so much was this tree held in esteem by the people of Asia, that wherever they erected any grand buildings, the porticoes which opened to the air, terminated in groves of these trees.

Culture of the PLANE-TREE.

The first species is propagated either from seeds or layers. The layers will take root in about a year, when they should be cut off from the old trees, and planted in a nursery, where they may stand two or three years to get strength, after which they should be transplanted to the places where they are to remain.

But the plants thus raised seldom make such straight trees as those produced from seeds, which should be sown in a moist, shady situation, soon after they are ripe, and when the young plants come up they must be treated in the same manner as those raised from layers.

The second species will succeed extremely well from cuttings, which should be planted about the beginning of October, upon a moist soil, and watered in dry weather: in which case they will make a prodigious progress, and in a few years afford noble trees for planting avenues and other shady walks.

Both these species thrive best in a moist soil, and near rivulets of water.

PLANT, *Planta*, is defined to be an organical body, destitute of sense and spontaneous motion, adhering to another body in such a manner as to draw from it its nourishment, and having power of propagating itself by seeds. As to the parts of which a plant consists, they are the root, stalk, branch, leaf, flower, and fruit.

All botanists are of opinion that there is a certain analogy between plants and animals, since plants, like animals, are composed of certain parts, vessels, &c. each kind of vessel being supposed the vehicle of a different humour or juice, secreted from the matter of the sap, which is considered as the blood or common fund of them all: two things are to be considered in plants, viz. the sensible and organic body, and the spirit or the vegetative body, which is the cause of the whole motion, and the principle of all vital functions. The spirit or active substance, which obtains the name of soul in living bodies, is not even entirely excluded from things destitute of life, since the subtile matter being carried by a perpetual motion, runs through the whole corporeal nature; but as it is too much dispersed in bodies deprived of life, nor can find in them pipes and receptacles wherein it could be gathered in a greater quantity, thereby it could expel the humours it should meet with, and not produce in them those vital motions of nutrition and accretion; hence fossils and other inanimated bodies are of a longer duration, because not disturbed or worn out by that vegetative and active substance: but in plants, as well as in animals, the active spirit continually agitated by the subtile matter, runs without intermission throughout the whole body; and the more or less it is agitated, it wants a greater

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a greater or less quantity of aliment, to avoid its feeding at last on the substance of the living body.

Plant and vegetable are nearly synonymous, every plant being a vegetable; which Boerhaave defines to be a body generated of the earth to which it adheres, and is connected with it by parts called roots, through which it receives the matter of its nourishment and increase, and consists of juices and vessels sensibly distinct from each other: or a plant is an organical body composed of vessels and juices every where distinguishable from each other, to which the roots grow, or parts by which it adheres to some other body, and from which it derives the matter of its life and growth. This definition is very scientific, and furnishes a just and adequate idea of a plant; for by its consisting of vessels and juices, it is distinguished from a fossil; and by its adhering to another body, and deriving its nourishment therefrom, and being destitute of sensation, it is distinguished from an animal; the mimosa, or sensitive plant, approaching the nearest to it.

The vessels, or containing parts of plants, consist chiefly of earth bound or connected together by oil. In plants burnt by the intensest fire, the earth or matter of the vessels is left intire and indissoluble by its utmost force; and consequently the matter thereof is neither water, air, salt, nor sulphur, but earth alone.

The study of plants is both innocent and delightful; whoever applies himself to it will be soon agreeably surprised with the capacious field it opens for inquiry, where the human mind may range at large, and every day make fresh discoveries equally useful and entertaining. Now as every country hath its spontaneous plants, to raise and cultivate them in climates different from their own, requires much skill and art; for the plants of cold climates will not bear the heat of warm ones, any more than those of the warm can support the cold. Some of the Cape plants, in the midst of the torrid zone, grew at first amazingly, but soon after they lost their leaves, and were with difficulty kept alive: in this there is a considerable latitude to be allowed, for plants may be raised in a climate not their own, provided the difference is not very great; for by degrees they become as it were naturalized to it (this is evident in most of our culinary plants, fruit-trees, wheat, &c. which originally came from foreign countries) for if they produce seeds, these seeds are much less apt to miscarry, and produce hardier plants than such as are brought immediately from their native country. Now if we attentively consider the circumstances in which particular plants are spontaneously produced, we shall directly discover a sure and successful method of cultivating them by art. Linnæus justly observes, in a curious paper upon this subject, in the first volume of the Swedish acts, that the directions given in many books of gardening are founded merely random practice; it being from wild plants alone that a rational method of culture can be deduced. He adds, that all plants grow somewhere wild, and that the business of art is to imitate their natural climate.

It was by following nature that the ingenious botanist abovementioned has been so successful in bringing up the vast variety of plants that have fallen under his care. The *rubus caule unifloro foliis ternatis* was some time ago, he tells us, thought incapable of being raised about Stockholm, till attention to its natural climate taught him to keep it covered with snow during the winter and great part of the spring. The *Musa*, or Plaintain-tree, the most specious plant in nature, had stood near an hundred years in the Dutch botanical garden, and could not be made to blow; but on considering it was a native of Surinam, where the weather is dry for near half the year, and rainy the next, it was kept long without water, and afterwards kept watered abundantly, which caused it to flower and perfect its fruit; and by the same management, another *Musa* was made to flower the next year.

Growth of PLANTS. When a seed has laid all the winter in the ground, without any signs of germination, in the spring, as the seed is distended by the heat of the

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sun, though never so little, there must be some vacant spaces left within it: and as fluids press every way, the nutritious juices of the earth, with which the seed is surrounded, will enter the hole which is at the end thereof, and fill up these vacancies. When they have once penetrated the seed, being extremely active, they enter the pores of the lobes, for the same reason that they first entered the seeds; from hence they are communicated to the radicle and plume, which are thereby distended, or, as it were unfolded. And thus is the circulation of the infant plant carried on, till the radicle by degrees extending itself into the earth, fixes there, and becomes capable at last of furnishing the whole plant with a nutritious juice, whilst the plume shooting in a contrary direction, in a very little time, flourishes above the surface of the earth.

Some authors have puzzled both themselves and their readers, in endeavouring to explain the reasons why the plume ascends and the radicle descends, when a seed happens to be inverted in the earth, which must often be the case, or, in other words, when the plume, which ought to tend upwards, lies lowest, or in any other direction but perpendicular, or pointing to the surface of the earth. It is certain, that seeds of all kinds, from the smallest to the largest, though thrown never so confusedly into the earth, and lying there in all manner of directions, notwithstanding these disadvantages, redress themselves when they come to spring, and rise with the plume perpendicular to the surface of the earth; and this is one of those amazing instances of the wisdom of providence which never leaves the welfare of its productions to chance, but conducts the most inconsiderable parts of the creation with so much art and œconomy, that the more we are acquainted with it, the more we must admire it. It seems exceedingly easy to explain how this perpendicularity is effected, if we only consider, that whilst the radicle is fixing itself in the earth, the plume lies betwixt the two lobes, which lobes afterwards shoot out of the ground, together with the plume, and become the seminal leaves in all plants, except those of the pulse kind, which have something analogous to them. We must also consider, that fluids of all kinds contain a great quantity of air.

This part then of the operation of vegetation seems to be performed in the following manner: The lobes of the seeds are distended with the nutritious saponaceous juice of the earth, which juice contains a great quantity of air: this air being rarified by the heat of the sun, is perpetually endeavouring to ascend, and get above the surface of the earth, that it may perspire through the pores of the lobes, and mix with the atmosphere, as we find in fact it does, when these lobes become the seminal leaves, and get above the surface of the ground; but the pores of the lobes being stopped by the surrounding earth, the confined air acting perpetually on the inside of the lobes, forces them to tend perpendicularly upwards, and consequently the plume.

If it should be said that barley, when steeped in order to be made into malt, or that acorns, chesnuts, or any other seeds, when laid in a moist place to sprout, send the radical downwards and the plume upwards, notwithstanding the pores of the lobes cannot, in this situation, be stopped by the surrounding earth: I answer, that even supposing the pores of the lobes not to be in the least obstructed, the same end will yet be answered, and the lobes, together with the plume, will be elevated perpendicularly, by the rarified air passing through the pores, and tending upwards.

But if we may suppose that the perspiring air carries along with it a portion of the nutritious juices in the form of a vapour, imperceptible to the naked eye; as such vapours always ascend, they must necessarily cause the lobes, from whence they perspire, to endeavour to ascend also: because they must have this tendency to rise, before they quitted the vessels in which they were contained, whilst circulating through the lobes.

If this be granted, with regard to the elevation of the plume, it will be unnecessary to mention the reasons

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why the radicle shoots downwards, because the radicle must of consequence grow in an opposite direction to that of the plume.

Let us now pursue the progress of the nutritious juice, or sap, and endeavour to investigate the method taken by nature to conduct this embryo to a state of perfection.

We have already observed that the radicle and plume receive their first nourishment from the lobes. Now, when the radical has fixed itself in the earth, and shot out fibres sufficient for the support of the plant, it is probable that the order of circulation is reversed, and that the lobes, now becoming the seminal leaves, receive, in their turn, nourishment from the root, either by the same vessels which originally conveyed nourishment to the radicle, or by others, which last seems most probable.

These lobes now become seminal leaves, and above the ground are of great use to the plant; for if these are taken away, before the true leaves are expanded sufficiently to perform their office, the plant immediately withers and dies.

It is a known maxim in hydraulics, that when a number of branches proceed from one large pipe or canal, if one of these branches is opened, a great quantity of the fluid circulating in these pipes will flow to every branch proceeding from the same pipe. Now these seminal leaves being once above ground, are in a perpetual state of perspiration, when the heat of the atmosphere is sufficient to rarify the juices of the plants enough for this purpose; or in an imbibing state, when the heat is not sufficient to make them perspire, so that plants generally perspire in the day-time, and imbibe the air and its contents in the night, at the leaves. When, therefore, these seminal leaves are in a state of perspiration, a greater quantity of the nutritious juices is derived not only to these seminal leaves, but also to the leading stem, or head of the plant, which is nourished by vessels proceeding from the same trunk with those which nourish the seminal leaves. By means of this perspiration, there is a perpetual supply of a nutritious fluid, drawn to the ascending branch of the plant, for its support and increase, which ceases, if the perspiration of these seminal leaves is by any means stopped, or if the leaves are taken away before the true leaves are expanded, and grown large enough to perform their office, and by perspiring in a due quantity, to draw a sufficient nourishment to the stem, or head.

As soon then as the true leaves are able to perform their duty, there being no farther occasion for the seminal leaves, they immediately wither and rot off; and this decay of the seminal leaves is probably caused by the air, which, entering the pores of the true leaves, is from thence communicated to the air vessels of the trunk, which being by that means extended to the very root, the small vessels, which before conveyed the nutritious juice to the seminal leaves, are compressed and stopped up: the consequence of which is, that the seminal leaves must perish.

We have now conducted the plant above the surface of the earth; it remains that we examine into some circumstances relating to its accretion or growth, and shew by what means it is brought to perfection.

What has been said of the seminal leaves drawing nourishment, holds good of all the true leaves of a plant: for they all bring nourishment to themselves and the adjacent parts, in the manner already observed; and as the rarified air and vapours in the leaves is constantly tending upwards, this still preserves the perpendicularity of the plant, and keeps the stem in an upright direction, unless it be forced to deviate from its perpendicularity, by some intervening accident.

As the body of the plant is daily more and more distended by the heat of the sun in all its dimensions, the fluids contained in it must be still more distended: I say more, because fluids having a less degree of cohesion than solids, their component parts more easily recede from each other, and therefore possess a greater space; the consequence of this is, that the containing vessels of the plant must be pressed in all directions by the con-

tained fluid, and grow larger: mean time the air contained in the air-vessels of the plant is also rarified and distended, so as to be constantly of the same density with the external air.

Thus the plant is constantly pressed between the internal and external air; and as the vessels of the plant are more expanded by the rarification of the internal air, the external air is also rarified, and consequently pressing less upon the plant, gives it more liberty to increase its dimensions, and yield to the internal pressure both of the sap, and the contained air.

The reflecting reader will readily observe, that something more than what we have already mentioned, is necessary towards vegetation: for otherwise the plant would be only distended, while its vessels grew continually thinner, just in the same manner as a glass vessel in the hands of the maker decreases in thickness, as the surface is enlarged by the air, which the operator forces into it. We are therefore to explain how plants increase in solidity, as well as dimensions.

This part of the operation seems to be performed by cold in the following manner:

The heat of the sun in the day-time having distended the sap in the leaves, and made part of it perspire through their pores, in order to draw nourishment to the adjacent parts, the coldness of the night immediately succeeding, when plants are not in a state of perspiration, this coldness contracts both the solids and fluids of the plant; for it is the nature of cold to contract all bodies whatever, and reduce them into a lesser space, and consequently the particles of matter of which they are composed, approach nearer to each other; now the particles of matter are known to attract each other very strongly at small distances, and infinitely more, when their surfaces come into exact contact with each other: therefore that part of the fluid sap which is nearest the solid sides of the vessels, is, by the action of cold, forced into contact with the solids, where it remains by the force of the increased attraction: and thus the salts and earth dissolved in the sap, are applied to the vessels, and reduced into a solid.

When once these particles of matter have acquired such a degree of cohesion, the heat of the sun, next day, approaching by gentle degrees, is not capable of dissolving this union, but on the contrary increases it, and, by drying up the superfluous moisture, renders it more solid.

Thus we see how necessary a vicissitude of heat and cold is to the vegetable world; for without it not a single plant could grow upon the face of the earth. Was the atmosphere to be always hot, vegetables would be in a constant state of perspiration, so long as the earth could afford a constant supply of juices; but then their dimensions could never be enlarged. On the other hand, if it was always to be cold, plants would be deprived of the cause of their extension, and consequently not grow at all. In either of these cases the brute creation must want nourishment, and consequently mankind.

Many have been the disputes among naturalists, concerning the circulation of the sap in vegetables; some will have it, that it rises in vessels analogous to the arteries in animals, and is again returned towards the root by other vessels analogous to the veins; others again are of opinion that there is no such retrogradation of the sap, and both parties produce experiments to justify their different sentiments. But perhaps there are no peculiar vessels in plants, distended like the arteries and veins in animals, for the flux and reflux of the circulating juices; but that the sap rises, and in some measure again retires, by the same vessels, as both the solid and the fluid parts of the plants are dilated by heat, and contracted by cold.

I shall now proceed to make some observations on the flowers of plants. The first thing then that occurs worthy of observation in flowers is, that they perform the same office to the generative organs, as the leaves do to the other parts of plants, that is, draw nourishment to them for their support, by perspiration; and that they

they do, actually perspire, and even in great quantities, is certain; because they transmit to our organs certain effluvia, which affects us with the sensation of smelling. These effluvia are a portion of the *spiritus rector*, or prevailing spirit, which is not alike in any two plants of different sorts; but the same in every one of the same species, allowing for the accidents of soil and climate, and is inimitable by art. This *spiritus rector* resides in the essential oils of vegetables, and is, probably, formed by the finest and most volatile parts of these essential oils, being mixed with the particles of light or heat, which are absorbed by them, and reside therein in a solid form. An annual plant, when it has once brought its seed to perfection, has answered the end of providence; and now the vessels which convey nourishment to the leaves being furred up, incrustated within, and rendered impervious, the leaves can no longer perspire, and therefore wither and drop off; mean time the vessels of the root and stem undergo the same fate with those of the leaves; so that the whole plant dies, putrifies, and helps to supply the earth with a fresh pabulum or food for a succeeding generation.

There is a large class of plants which are called perennial, of which sort are trees that live for ages; these, like annual plants, shed their leaves at the approach of winter, and for the same reason; but then the sap-vessels in the root and trunk continue pervious or hollow, so that, even in the winter, a kind of languid circulation is maintained. These, at the approach of the spring, when the heat is increased, and the earth has recruited itself with a new stock of pabulum or food for their support, put out leaves afresh, perspire and grow, till at last the sap-vessels in the root and trunk are obstructed, and become impervious by degrees, so that when the circulation is intirely stopped in any part of it, the air dissolves its texture, and it gradually decays and rots.

Sleep of PLANTS, is the nightly change of posture in their leaves; for the leaves of certain plants assume at night a disposition different from that of the day.

In order to discover the causes which produce this remarkable effect, it will be necessary to consider previously the structure of the leaves.

Between the two skins of the leaf, which are continuations of the outer rind of the stalk, run innumerable fibres of a large kind, with clusters of more minute ones, in various forms, among them. The larger vessels are of a woody substance, hollow, and smaller all the way from the base of the leaf: they are collected together in a compact manner in the footstalk; and are originally sent from the pith within the stem. These fibres serve to support the leaf in its proper position; and if it is affected either by an external or internal cause, will change that position.

Such is the structure of the leaves of plants, which are exposed to the air, moisture and light; the only bodies that are in contact with the plants. One of these, therefore, or a combination of two or more of them, must produce this amazing phenomenon. The air, we know, is constantly in a fluctuating state, occasioned by the various degrees of heat and cold, and therefore seems to have some claim to our attention as a principal agent in producing this effect: but the experiments of Linnæus have sufficiently demonstrated, that neither heat nor the air is the principal cause of the wonderful appearance, for he found the plants in a stove, where there is no alteration in the degree of heat, and the same density of the air, exhibited the same phenomena. Nor can moisture be the principal agent; for it has been found that the same appearance always recurred, whether the plant was watered or not; and whether this was done in a plentiful or a sparing manner.

Three of the four natural agents are therefore excluded, and the fourth only remains to be considered; and this will be found sufficient for the purpose; the change of position in the leaves of plants at different periods of the day and night being owing to this agent.

Light is subtle, active, and penetrating: by the

smallness of its constituent parts, it is capable of entering bodies; and, by the violence of its motion, of producing great effects and changes in them. These are not permanent, because those rays which occasion them are, in that action, extinguished and lost. The change produced in the position of the leaves of plants by light, is the result of a motion occasioned by its rays among their fibres: to excite this motion, the light must touch those fibres; and where light touches it adheres, and becomes immediately extinguished.

These are the properties of light, and, according to these, the change we attribute to it; being once effected, must be continued so long as the light continues, and no longer.

The raising of the lobes in these leaves is owing to the power of those rays which at any one instant fall upon them: these become extinguished; but others immediately succeed to them, so long as the air in which the plant stands is enlightened: so that in full light the lobes continue in their most raised position, and droop in proportion as the light becomes less.

Thus have we discovered the cause of this amazing phenomenon; and shall only add, that a great number of experiments have sufficiently demonstrated, that this theory is founded on truth, and that light is the sole agent in producing the sleep of plants.

PLANTING is setting a tree or plant taken from its proper place, in a new hole or pit; throwing fresh earth over its root, and filling up the hole to the level of the surface of the ground.

The first thing in planting, is to prepare the ground, before the trees or plants are taken out of the earth, that they may remain out of the ground as short a time as possible; and the next is to take up the trees, or plants, in order to their being transplanted.

In taking up the trees, carefully dig away the earth round the roots, so as to come at their several parts to cut them off; for if they are torn out of the ground without care, the roots will be broken and bruised to the great injury of the trees. When you have taken them up, the next thing is to prepare them for planting by pruning the roots and heads. And first, as to the roots, all the small fibres are to be cut off, as near to the place from whence they are produced, as may be, except they are to be replanted immediately after they are taken up. Then prune off all the bruised or broken roots, all such as are irregular, and cross each other, and all downright roots, especially in fruit-trees: shorten the larger roots in proportion to the age, the strength, and nature of the tree; observing that the walnut, mulberry, and some other tender-rooted kinds should not be pruned so close as the more hardy sorts of fruit and forest-trees: in young fruit-trees (such as apples, pears, plums, peaches, &c.) that are one year old from the time of their budding or grafting, the roots may be left only about eight or nine inches long; but in older trees, they must be left of a much greater length: but this is only to be understood of the larger roots; for the small ones must be chiefly cut quite out, or pruned very short.

The next thing is the pruning of their heads, which must be differently performed in different trees; and the size of the trees must also be considered: thus, if they are designed for walls or espaliers, it is best to plant them with the greatest part of their heads, which should remain on till they begin to shoot in the spring, when they must be cut down to five or six eyes, at the same time taking care not to disturb the roots. But if the trees are designed for standards, you should prune off all the small branches close to the place where they are produced, as also the irregular ones which cross each other; and after having displaced these branches, you should also cut off all such parts of branches, as have by any accident been broken or wounded; but by no means cut off the main leading shoots, which are necessary to attract the sap from the root, and thereby promote the growth of the tree.

Having thus prepared the trees for planting, you must now proceed to place them in the earth; but first, if the trees

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trees have been long out of the ground, so that the fibres of the roots are dried, place them eight or ten hours in water, before they are planted, with their heads erect, and the roots only immersed therein, which will swell the dried vessels of the roots, and prepare them to imbibe nourishment from the earth. In planting them great regard must be had to the nature of the soil; for if that be cold and moist, the trees should be planted very shallow; and if it be a hard rock or gravel, it will be better to raise a hill of earth where each tree is to be planted, than to dig into the rock or gravel, and fill it up with earth, as is too often practised, by which means the trees are planted as it were in a tub, and have but little room to extend their roots.

The next thing to be observed, is to place the trees in the hole in such a manner that the roots may be about the same depth in the ground, as before they were taken up: then break the earth fine with a spade, and scatter it into the hole, so that it may fall in between every root, that there may be no hollowness in the earth: then, having filled up the hole, gently tread down the earth with your feet, but do not make it too hard, which is a great fault, especially if the ground be strong or wet.

Having thus planted the trees, they should be fastened to stakes driven into the ground, to prevent their being displaced by the wind, and some mulch laid upon the surface of the ground about their roots: as to such as are planted against walls, their roots should be placed about five or six inches from the wall, to which their heads should be nailed, to prevent their being blown up by the wind.

The seasons for planting are various, according to the different sorts of trees, or the soil in which they are planted: for the trees whose leaves fall off in winter, the best time is the beginning of October, provided the soil be dry; but if it be a very wet soil, it is better to defer it till the latter end of February, or the beginning of March; and for many kinds of evergreens, the beginning of April is by far the best season; though they may be safely removed at Midsummer, provided they are not to be carried very far; but you should always make choice of a cloudy wet season.

Reverse PLANTING, a method of planting, in which the natural position of the plant, or shoot, is inverted; the branches being set into the earth, and the root reared into the air.

Dr. Agricola mentions this monstrous method of planting, which he found to succeed very well, in most or all sorts of fruit-trees, timber-trees, &c. Bradley affirms, that he has seen a lime-tree in Holland growing with its first roots in the air, which had shot out branches in great plenty, at the same time that its first branches produced roots and fed the tree.

Mr. Fairchild, of Hoxton, has practised the same with us, and gives the following directions for performing it: Make choice of a young tree of one shoot, of alder, elm, willow, or any other tree that easily takes root by laying; bend the shoot gently down into the earth, and so let it remain till it has taken root. Then dig about the first root, and raise it gently out of the ground till the stem be nearly upright, and then stake it up. Then prune the roots, now erected in the air, from the bruises and wounds they received in being dug up, and anoint the pruned parts with a composition of two ounces of turpentine, four ounces of tallow, and four ounces of bees-wax, melted together, and applied pretty warm. Afterwards prune off all the buds or shoots that are upon the stem, and dress the wounds with the same composition, to prevent any collateral shootings, that might spoil the beauty of the stem.

PLOUGHMAN'S SPIKENARD. See the article *Ploughman's SPIKENARD*.

PLUM, a fleshy vessel, inclosing a hard, brittle shell, in which is one or two seeds.

PLUM-TREE, *Prunus*, a genus of plants, ranged by Linnæus among the *icosandria monogynia*.

The varieties of plums cultivated in the gardens are very numerous; some reckon upwards of sixty sorts, all distinguished by different names.

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All the species of plums have within their fruit a hard stone, within which there is contained a soft and tender kernel: this kernel contains the seminal plant, from which would be produced another tree of the same kind, if it were set in the ground; and it is very natural to suppose, that the only use of the thick stone or husk of this was to preserve its tender substance from rotting too soon in the earth, and to give it a proper time for developing its parts, to preserve its natural oiliness during that time, and to furnish from its own substance a proper nourishment to the growing plant; for observation shews, that it finally breaks into a very fine powder.

There has not been found any species of plum which had not its kernel contained in a stony coat of this kind, from whatever grafts they have been propagated; nor is there any art known by which the kernel of this sort of fruit can, while growing, be deprived of its coat.

Mr. Marchand, however, in the year 1735, shewed, before the academy of sciences at Paris, certain plums, whose kernels had no stone or shell round them; and found that they grew upon a tree which never had produced any others, and which had been known to produce such for twenty years. The kernel in these was covered with a reddish skin, which was rough to the touch; and, within that, with another, which was thinner and white. The kernel had nothing particular in it, except that it carried on one side of its outer surface, and that always in the same place, a little stony prominence, more or less dented on its convex part: this is usually a twelfth of an inch broad, and two thirds of an inch long, and has no other appearance but that of a distempered part of the kernel, only that all the kernels have it.

The thick wrinkled skin which surrounds the kernel, seems in this case to supply the place of the stone or hard shell; and in this also it resembles it, that the pulp of the fruit parts easily and readily from it: and the hard oblong body, which is placed on one side of the kernel, is by no means proper for this purpose. *Mem. Acad. Sciences, Par. 1735.*

Culture of the PLUM-TREE.

All the sorts of Plums are propagated by inoculating, or grafting them upon stocks of the Muscle-plum, the white Pear-plum, the St. Julian, or the *bonum magnum*.

Inoculating is much properer than grafting for these trees, as they are apt to throw out a great deal of gum from the wound: and the trees should be no more than one year's growth from the bud, when they are transplanted; for, if they are more, they seldom succeed well, being very subject to canker; and if they escape that, they usually produce only two or three luxuriant branches. The whole management of planting and pruning them is the same with that of peaches. See **PEACH**.

If the walls against which they are planted are low, they should be set eighteen feet asunder; if they are higher, then fourteen or sixteen.

Plums should have a middling soil, for they seldom succeed well in too moist or too dry a one; and, when planted against walls, should have an east or a south-east prospect. If they have one at full south, they are apt to shrivel up, and become mealy. Plums in general succeed very well, with proper care on espaliers; they will also bear very well as standards, but the fruit will not be so well tasted. Plums do not only produce their fruit on the last year's wood, but also on spurs that come out of the wood at two or three years old. It is a common error to be too free with the knife in the winter pruning, cutting off the extremities of all the branches; the consequence of which is, that there is an over quantity of young shoots produced, and the fruit is small and poor.

Bay PLUM. See the article **GUAYAVA**.

Cocoa PLUM, *Chrysobalanus*, a genus of plants, of which there is only one species.

This plant is a native of America. It rises with a shrubby stalk about eight or ten feet high. The branches are covered with a dark brown bark, spotted with white. The leaves are oval, stiff, and are indented at their ends, in form of a heart, and are placed alternately

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nately on the branches. The flowers are produced in loose bunches: these are small and white; the flowers are succeeded by oval Plums about the size of a damson: some of these are blue, some red, and others yellow; they have a sweet luscious taste.

Culture of the Cocoa PLUM.

It is propagated by seeds, which should be obtained from America. They must be sown in the spring in small pots, and plunged into a hot-bed of tanners bark. In six weeks the plants will come up, and, if properly treated, will be fit to remove in a month's time, when they are to be carefully separated, and each planted into a separate small pot, and then plunged into the hot-bed again, observing to shade them from the sun till they have taken fresh root, after which they must have air every day in proportion to the warmth of the season, and frequently watered during the summer.

In the autumn the plants must be removed into the bark-stove, and plunged into the tan-bed, observing to give them very little water in winter, and constantly managed in the same manner as other tender plants from the same countries.

Indian Date PLUM, a species of *Diospyros*. This plant is a native of Italy and Mauritania. It rises to the height of thirty feet, and produces plenty of fruit every year, from the seeds of which many plants have been raised.

Culture of the Indian Date PLUM.

It is propagated by seeds, which may be sown in the open ground, but the best method is to sow them upon a moderate hot-bed, when the plants will come up much sooner, and make a greater progress: but in this case the seeds should be sown in pots of earth, and plunged into the bed, for the plants will not bear transplanting till autumn.

When the plants have attained some height, they should by degrees be inured to the open air. In June they may be wholly exposed, and remain abroad till November, when it will be proper to take them into shelter, but they should have as much free air as possible in mild weather.

In the spring following, before the plants begin to shoot, they should be transplanted into a nursery, in a warm situation, where they may be trained up for two years, and then removed to the places in which they are designed to remain.

Jamaica PLUM, *Spondias*, a genus of plants, of which there is only one species.

This tree is a native of the West Indies, where it grows to the height of twelve or fourteen feet, but in England it seldom attains above half that height.

The leaves are very long, sawed on their edges, and end in acute points. The flowers are of a pale yellow, some of which are succeeded by oval berries, inclosing a nut.

Culture of the Jamaica PLUM.

This tree is propagated by the nuts, which should be obtained from the Leeward islands. These should be planted in pots as soon as they arrive, and plunged into a hot-bed of tan, where, if the bed is in a proper temperature of heat, the plants will appear in a month or five weeks. When they have obtained strength enough to be removed, they should be shaken out of the pots, and carefully parted, planting them in separate small pots, and plunging them into a fresh hot-bed of tan, shading them from the sun till they have taken fresh root; after which they should have free air, and be supplied with water in proportion to the warmth of the season. They must always remain in the bark-stove, where they generally drop their leaves in the spring, and after remain naked two or three months.

POCCOON, or *PUCCOON*, *Sanguinaria*, a genus of plants, of which there is only one species.

This plant is a native of most of the northern parts of America, where the ground is in many places covered with its flowers, which bear some resemblance to our Wood Anemone.

Culture of the Poccoon:

This plant is propagated by its roots, which may be

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taken up and parted every other year; the best time for doing this is in September, that the roots may have time to send out fibres before the hard frosts set in.

It requires a loose soil, and a sheltered situation, not too much exposed to the sun. The roots should be marked, or it will be very difficult to find them after their leaves decay: for being of a dirty brown colour on the outside, they are not easily distinguished from the earth.

POCKWOOD. See the article **GUAIAACUM**.

POD, a sort of pericarpium, consisting of two valves, which open from the base to the point, and are separated by a membranaceous partition, from whence the seeds hang by a kind of funiculus umbilicalis.

POLEY MOUNTAIN, *Polium*, a genus of plants, of which there are an infinite number of species, and many of them never admitted into gardens: all those which are, require the following culture.

Culture of the POLEY MOUNTAIN.

These plants are propagated by seeds, which must be procured from the countries where they naturally grow, for they seldom ripen their seeds here.

These should be sown in the spring upon a bed of fresh light earth. When the plants come up, they must be carefully kept clean from weeds, and about the middle of July they should be transplanted upon a warm border of dry soil, observing to shade them from the sun, and to water them till they have taken new root, after which they will require no other culture but to be kept clean from weeds.

They may also be propagated by cuttings or slips, which should be planted the beginning of April, upon a border exposed to the east; they must be shaded, and watered if the season proves dry, till they have taken root, after which they will require no care, but to keep them clean from weeds till Michaelmas, when they should be removed to the places in which they are designed to remain.

POLIANTHUS, or **POLYANTHUS**, a variety of the common Primrose.

The root of this plant is composed of numerous thick fibres. The leaves rise in a cluster, and are large, oblong, broad, of a deep green, irregularly waved at the edges, and obtuse at the end. In the centre of these rises the stalk, which, when the plant is in strength and vigour, is thick, firm, upright, and ten inches high, bearing at its top a large tuft of very beautiful flowers. These are supported on their separate pedicles, rising together from the head of the main stalk, and they are naturally of a beautiful crimson, with an eye of yellow. When weak or ill managed, they will produce a single flower upon the stalk, in the manner of the common primrose: but when encouraged by a right culture, they will throw out a vast number on each head, whose variations in colour will be extremely pleasing, and the beauty in many of them equal that of the Auricula. The stalk will also, from great nourishment, sometimes have films upon it, and the edges of the cups of the flowers will be swelled out by a leafy addition, stained with purple.

Culture of the POLIANTHUS.

The common method of propagating this plant is, by parting the roots: but the only way to obtain new varieties is from seeds, which the gardener should take particular care to save from the finest flowers, by marking them when in full bloom. The properties required in a fine flower are, strength of the stalk, breadth and number of the pips, and their high colour.

Such being marked, let those which grow among them and are of a poorer kind, be taken up and planted in some other place, lest the wind should bring the dust from their buttons into these finer flowers; from time to time let those which remain be gently watered, and the earth stirred about them. If the bees are busy among them, let them be driven away, for they will bring the dust from one flower to another: it is the substance of which they make their wax, and as they come loaded from a poor flower, some of it may scatter into a good one, and hurt the seeds.

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The two last weeks in May give the plants no water, and when the seeds are ripe, which will be about the middle of June, the seed-vessel will open, then the gardener must watch them very close, for they do not all ripen together: once in two days therefore he must examine them, and carefully cut off such as are ripened, with a part of the main stalk, laying them upon a shelf in a dry airy room, first covering the shelf with paper, and raising a ledge upon the edge of it, to prevent any of them from falling off, or any of the seeds which drop from them; great care must be taken not to shake the seeds from out of the heads, but these laid at a distance from one another to harden.

The seeds thus saved in June will be ready for sowing the latter end of December. Chuse for this purpose a mild open day, and pour into a large flat box, made of rough boards, as much of the following compost as will fill it within two inches of the rim.

Let a quantity of good mould be taken from under the turf in a dry fertile pasture, and mix with it one third part of the earth from under a wood-pile: let these be well blended together, and thrown in a heap, six months before it is wanted, to mellow and receive the influences of the rains and air.

When the box is filled with this compost, as before directed, mix up with some that is left, one third part more of earth from the wood-pile, and one fourth dried cow-dung rubbed to pieces: blend this very well, and spread a covering of it half an inch thick over the earth in the box: then shake the seeds out of their capsules, and mix carefully with them as much wood ashes and as much middling sand washed clean, and scatter it over the surface of the earth in the box. With the remainder of the enriched compost, mix some more wood-pile earth, and having thus made it very light and fine, sift some of it over the seeds, covering them about a quarter of an inch: give the earth no water, but set the box in some part of the garden, where it may have the full benefit of the sun, and some shelter from very heavy rains. Thus let it stand during the coldest months, but when the spring comes on, let it be removed into a place where it is sheltered and shaded from the sun, except for the two or three first hours in the morning: in this manner the young plants will appear, and come slowly and gradually forward. When they are a little grown they must be gently watered at times, and about five months from the time of sowing they will be fit to transplant.

Chuse a shady border, and taking off the mould four inches deep, fill its place with some of the compost. In the evening of a moist day transplant them into this border: draw lines length-ways and a-cross the border, at five inches distance; in the centre of each square, made by these lines, open a little hole, and taking up the plants one by one, place them immediately as they are taken up, one in each hole, and give them a very gentle watering; from this time repeat the watering every evening for a week, and every other, or every third day afterwards, unless in rainy weather, for two months. Once in a week stir and break the mould between them with a small trowel, and if a dead leaf any where appears nip it off.

The first week in September prepare a border in another part of the garden: let it be sheltered from the south sun, but open to its rays in a morning. Clear the upper part of this, as of the other, to six inches depth, and fill it up with the remainder of the compost: draw lines length-ways and across, at seven inches distance, and in the centre of each square open a hole: into these remove the plants, taking them up with a ball of their own earth, and carefully watering them till they are rooted. In October stick up a few furze-bushes about the border, to defend the plants from the severity of the weather, and thus let them stand till spring. In March let the furzes be taken away, and the earth broken between the plants, and in April they will flower.

Their flowers will not be so strong this as the succeeding years, and there will be a number of an inferior sort, but there will also be many very fine ones: let a

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stick be set down by each of these as a mark, and let a quantity of the same compost be made up into a border, in a shady part of the garden, where the morning sun comes: this must be a spade deep, for it is the place where they are to remain. When the flowering is over, let the stalks of these fine ones be cut off, that the roots may not be exhausted by ripening seeds while they are so young, and about a week afterwards plant them out in the border prepared for them, at a foot distance. Water them gently till they are well rooted, and after this they will require no particular care, only the earth should be broke between them at times with a trowel, thus they will flower in their full glory the succeeding spring, and many of the flowers will nearly equal Auriculas.

For their management afterwards, no more is required than this:

Every October let a fresh quantity of the compost already directed, be prepared, and the succeeding August let the border of Polianthus's be dug out, the roots carefully taken up and laid in the shade, and when the earth is carried away, let the fresh compost be put in its place: then part the roots, and plant the strongest and finest in the border, at the same distance as at first, and the rest in other parts of the garden: this will keep them in their full beauty, and provide an annual increase.

But the gardener should always continue to raise seedlings, if he is desirous to obtain new flowers, and for this purpose he must save the seeds from the finest of his flowers, and manage the young plants as already directed. By this means he will continue to improve his stock, and it is impossible to say to what excellence this kind may be raised by such methods.

POLLEN, meal, or a fine dust, contained and secreted within the antheræ, and destined for the impregnation of the germen.

POMEGRANATE, *Punica*, a genus of plants, ranged by Linnæus among the *icofandria monogynia*; there is only one species of this genus, with the following varieties. The wild Pomegranate, with single and double flowers. The small flowering Pomegranate, with single and double flowers. The Pomegranate, with striped flowers; and the sweet Pomegranate.

The Pomegranate-tree is a native of Italy, Spain, and Africa. It is naturally a straggling shrub, breaking from a small height into numerous branches, but it may be trained by proper management, into the form of a tree, or led over a great extent of wall. The trunk is covered with a rough brown bark, and the younger shoots are reddish. The leaves resemble myrtle, but they are of a yellower green, and of a glossy surface: they have high ribs on the under part, and when bruised they smell strong and disagreeable. The flowers grow at the extremities of the branches, and on young shoots from other parts: they are large and very beautiful, deep, hollow, ruffled, and of a glowing scarlet. They are succeeded by a roundish fruit, having a hard shell, inclosing a pulp filled with angular seeds.

Culture of the POMEGRANATE.

It is easily propagated by laying down the branches in the spring, which in one year's time will take good root, and may then be transplanted where they are designed to remain.

The best season for transplanting these trees is in spring, just before they begin to shoot. They should have a strong, rich soil, in which they flower much better, and produce more fruit than if planted on a dry, poor earth. They should be planted against warm walls, in a good situation.

It has been observed that the flowers of this tree always proceed from the extremities of the branches which were produced the same year: this therefore directs that all weak branches of the former year should be cut out, and that the stronger should be shortened in proportion to their strength, in order to obtain new shoots in every part of the tree.

Though the fruit of this tree seldom arrives to any perfection in this country, yet for the beauty of its scarlet-coloured flowers, together with the variety of its fruit,

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fruit, it is worthy a place in every collection, especially as the culture it requires is not great.

POMPION, or PUMPKIN. See the article PUMPKIN.

POPLAR-TREE, *Populus*, a genus of plants, ranged by Linnæus among the *diœcia octandria*, and of which he distinguishes the five following species. 1. Poplar-tree, with roundish leaves, angularly indented, and downy on their under-side; or the white Poplar. 2. Poplar-tree, with roundish leaves, which have angular indentures, and are smooth on both sides, being the trembling Poplar; or the Aspen-tree. 3. Poplar-tree, with triangular, acuminate, sawed leaves; or the black Poplar. 4. Poplar-tree, with oblong, heart-shaped, crenated leaves; or the Carolina Poplar. 5. Poplar-tree, with heart-shaped, roundish leaves, the uppermost of which are hairy.

The first, second, and third species of this tree are natives of different parts of Europe; and the fourth and fifth grow naturally in North America.

Culture of the POPLAR.

All these species are easily propagated either by layers, cuttings, or suckers, of which the white kind always produces a great many from the root. The best season for the transplanting these suckers is in October, when the leaves begin to decay; and they should be placed in a nursery for two or three years, at the end of which time they will have got strength enough to be transplanted into the places where they are designed to remain.

When they are to be propagated by cuttings, it is best to do it in February, cutting off large truncheons of eight or ten feet long, which being thrust down a foot deep in the ground, will take root very quick, and if the soil is moist, will grow to a considerable size in a few years.

The black Poplar is not so easily raised from these truncheons, but should be planted in cuttings about a foot and a half long, planting them about a foot deep in the ground. This will grow on almost any soil or situation, but succeeds better on a moist one than any other.

The Poplars are the fittest of all trees for raising a shade in a little time, as they will grow sometimes fourteen feet in height in one season, and in four or five years will be large trees.

POPPY, *Papaver*, a genus of plants, ranged by Linnæus among the *polyandria monogynia*, and of which there are eight species. 1. Poppy, with globular, furrowed, and prickly capsules, and a leafy stalk, bearing many flowers. 2. Poppy, with nail-shaped, prickly heads, and a leafy stalk, bearing many flowers. 3. Poppy, with prickly heads, and a naked prickly stalk, bearing one flower, and double-winged leaves. 4. Poppy, with prickly heads, a naked, rough stalk, with one flower, and single-winged, sinuated leaves. 5. Poppy, with smooth, globular heads, a hairy stalk with many flowers, and wing-pointed, cut leaves; or the common red field Poppy. 6. Poppy, with smooth capsules and cups, and with cut leaves embracing the stalks. 7. Poppy, with oblong, smooth heads, a smooth stalk bearing many flowers, and cut, winged leaves. 8. Poppy, with smooth heads, rough, leafy stalks, having one flower, and sawed, winged leaves.

Most of the Poppies are natives of England, and there are several varieties of most of the species, which have been obtained from seeds: among these the feathered Poppy is one of the most beautiful, and the culture of it will sufficiently direct the gardener in that of all the rest.

The root is large, long, white, and hung with fibres. The stalk is a yard or more in height, and the leaves are of a greyish or blueish green, oblong, and cut at the edges. The flowers are large and extremely elegant; they are composed of numerous long petals, which are cut and jagged deeply into many parts at the edges, and have somewhat of a feathered aspect. Their colour is naturally a very elegant and bright scarlet, but they are varied in this respect without limitation: they

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are sometimes blotched; and at others beautifully streaked with purple and with white. The bases of these petals are naturally white, and there is usually more or less of white mixed with great elegance in the whole flower.

Culture of the Feathered POPPY.

This and every variety of the Poppy are obtained from seeds, every sowing still producing new kinds of flowers. The method to be observed is this:

When the plants are in flower, let the finest of them be marked for seed, observing to let only three heads ripen upon one plant: let them remain till they are very well hardened, and then taken off and laid on a papered shelf. When they have lain three weeks, at a distance from one another, and turned every day, let them be cut open, and the seed scattered loose upon the shelf, and when it has lain thus ten days, it will be fit for sowing.

The latter end of September let a bed of rich and fine garden mould be well dug and levelled, and upon this sprinkle the seeds tolerably thick, sifting over them a quarter of an inch of the same mould.

When the plants have a little strength, thin them to four inches distance, taking care to pull up the weakest; water those that are left at times, and keep them carefully weeded: and when they are so large as to touch each other, thin them again, leaving only as many of the strongest plants as will stand at eight inches distance, and from this time weed and water them carefully.

When they are near flowering, let the gardener keep a watchful eye over them, and as soon as he perceives any ordinary flower, let it be pulled up. There will be found among the others a variety of beautiful kinds, and the seeds of the best of these which ripen them well, must be saved for the next sowing.

This must be done every year, and the bed of them must be made every time upon a new piece of ground, for change of place is a very essential article, and which the gardener must never neglect: thus the plants will improve every year in elegance, and some of them will be very little inferior to carnations.

POTATOE, a species of *Lycopersicon*, or Love-apple.

There are two sorts of Potatoes. 1. The red-rooted, which bears purplish flowers. 2. The white-rooted, which bears white flowers.

Culture of the POTATOE.

These plants may be propagated from seeds, but this way is uncertain, as they are rarely perfect, and are more readily propagated by their roots, which multiply very fast if planted in a proper soil; therefore there is no necessity for practising any other method. The latter end of March is the season for planting them; the common way is either to plant the small roots entire, or to cut the large roots in pieces, leaving an eye or two to each piece; this method is very well in the contracted distance the gardeners commonly plant them, which is not above a foot asunder; but if the roots are chosen large and fair, without cutting, and planted at the distance of a foot and a half in the rows, and two feet and a half row from row, they will have room to extend their fibres, which will produce a greater quantity of roots, and larger, on the same space of ground, than in the common method: the depth they should be planted is about seven inches, but it is a wrong practice to plant them with a dibber, as it leaves a cavity underneath the plant; therefore they are best planted after the plough in the furrows, or where the spade is used, in the trenches.

When the plants are come up, the earth should be well stirred with a hoe, which will destroy the weeds, and let in the rains and dews more readily, which is of singular service to the plants, and being repeated a second time, will be all that is necessary, as the stalks will cover the ground and keep down the growth of weeds, whereby it will be rendered clean for any succeeding crop.

In autumn the haulm should be mowed down, and the roots taken up soon after, and laid in a sheltered place, which the frost cannot easily penetrate, where they may be kept for use.

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The soil in which Potatoes thrive best is a light sandy loam, not too dry or too moist, which should be well wrought before planting, and a good quantity of rotten dung intermixed with it, which will make them grow luxuriantly.

Spanish POTATOE, a species of *Convolvulus*, or Bindweed.

These roots are annually imported from Spain and Portugal: they are sometimes cultivated, by way of curiosity, in England, but seldom arrive to any perfection here; they require a great deal of room, for they send out many trailing stalks, which extend to a considerable distance every way, and at their joints put forth roots, which in warm countries grow to be large tubers, so that from a single root planted an incredible number of others are produced.

Culture of the Spanish POTATOE.

It is propagated by the roots, which should be planted on a hot-bed in the spring, and if the plants are covered in bad weather with glasses, they will produce flowers, and some small roots will proceed from the joint of the stalks, but if they are exposed to the open air, they seldom grow to be of any size.

PRICKLY PEAR. See the article *Indian FIG.*

PRICKWOOD. See the article *SPINDLE-TREE.*

PRIMROSE, *Primula*, a genus of plants, ranged by Linnæus among the *pentandria monogynia*, and of which he makes the *Auricula* a species: but other authors consider that as a distinct genus, and enumerate four species only of the Primrose. 1. Primrose, with rough, indented leaves, and foot-stalks bearing one flower. 2. Primrose, with rough, indented leaves, and flowers growing in bunches, called Cowslip: of this species the *Polyanthus* is a variety. 3. Primrose, with smooth, wedge-shaped leaves, and bifid segments to the empalement, called Bird's-eyes. 4. Primrose, with heart-shaped, crenated leaves, having foot-stalks, and flowers growing in bunches on very long foot-stalks.

There are several varieties of the first and second species now cultivated in our gardens: the method of doing which, has been treated of at large under the article *POLYANTHUS*, to which article we refer the reader.

Tree PRIMROSE, *Oenothera*, a genus of plants, ranged by Linnæus among the *octandria monogynia*, and of which there are three species. 1. Tree Primrose, with oval, spear-shaped, plain leaves. 2. Tree Primrose, with spear-shaped, waved leaves. 3. Tree Primrose, with spear-shaped leaves, and capsules which have acute angles.

The first and third species are natives of Virginia, and the second of Buenos Ayres.

Culture of the Tree PRIMROSE.

The first and third species are propagated by seeds, which should be sown in autumn. When the plants come up, they should be thinned, and cleared from weeds, which is all the care they require till autumn, when they may be transplanted to the places where they are designed to flower. They will thrive in almost any soil or situation.

The third sort may also be propagated by parting of the roots, which should be done in spring.

The second species is propagated by seeds, and if they are permitted to scatter, the plants will come up the following spring: the only culture they require, is to be kept clean from weeds, and thinned where they grow too close.

PRIVET, *Ligustrum*, a genus of plants, ranged by Linnæus among the *diandria monogynia*, and of which he distinguishes only one species, but according to other authors there are two, and Mr. Miller enumerates three, making the Carolina blue-berried Bay, one.

The other two species are, 1. The common Privet. 2. The Italian ever-green Privet.

The first species grows naturally in the mountainous parts of Europe, and in the hedges in most parts of England.

The second species is a native of Italy. Both these sorts are cultivated in our gardens, but the Italian Privet

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is to be preferred to the common, as it continues green all the year.

Culture of the PRIVET.

The common and Italian Privet are easily propagated by laying down the tender shoots in autumn, which in a year's time will be fit for transplanting to the places where they are designed to remain.

They may also be propagated by cuttings, which should be planted in autumn on a shady border, and in a loamy soil, where they will take root very freely, and may then be treated in the same manner as the layers.

But the strongest and best plants are those raised from seeds, though this method is seldom practised, being very tedious, for the seeds most commonly lie a year in the ground before they vegetate: for which reason the berries should be put in pots with sand between them, and the pots buried in the ground, where they must remain a year, and then be taken up, and the berries sown on a border exposed to the east. The plants will appear the following spring, and as soon as they have got some strength will make a rapid progress.

The blue-berried Bay is propagated by the berries, which are brought to England from Carolina and other parts of North America. These should be sown in pots, and plunged into a moderate hot-bed: when the plants come up they must have plenty of air in warm weather, and screened from the sun in the heat of the day. The following spring they should each be transplanted into a separate small pot, and plunged into a moderate hot-bed till they have taken new root, after which they should be gradually inured to the open air. For two or three years, while the plants are young, they should be sheltered in the winter, and then they may be planted in the full ground.

It may also be propagated by layers, and the cuttings, if they are planted in the spring, and carefully managed, will take root.

Ever-green PRIVET, *Alaternus*, according to Linnæus a species of *Rhamnus*, but by other authors considered as a distinct genus.

This plant is a native of Europe: there are several varieties of it, among which are the blotched Phillyrea, and the silver and gold-striped *Alaternus's*.

Culture of the Ever-green PRIVET.

This plant and all the varieties of it are easily propagated by laying down the branches in autumn. The autumn following they may be cut off from the old root, and planted in the nursery, or in the places where they are designed to remain.

When they are planted in a nursery, the longest time they must remain there is three years, after which they cannot be removed safely without injuring the roots, which spread to a great distance on every side.

Mock PRIVET, a genus of plants, of which some authors have distinguished several species, but Linnæus, who has ranged it among the *diandria monogynia*, considers only two. 1. Mock Privet, with spear-shaped leaves almost entire. 2. Mock Privet, with oval, heart-shaped, sawed leaves.

Both these species are natives of the southern parts of Europe, and rise to the height of eighteen or twenty feet.

Culture of the Mock PRIVET.

They are propagated either by seeds or layers: if by layers, the proper time for doing it is in autumn. Let them be kept clean from weeds, and in the autumn following taken off from the old plant, and placed in the nursery, where they may be trained three or four years in the manner they are intended to grow; after which, about the end of September, they may be transplanted to the places where they are designed to remain, taking care to preserve a large ball of earth to the root of each plant: some mulch must be laid upon the surface of the ground to prevent its drying, and let the plants be supported by stakes till they are well rooted in the earth.

If the plants are propagated by seeds, they should be sown in autumn, soon after they are ripe, in pots or boxes filled with light loamy earth, and placed under a garden-frame, where they should be protected from hard

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hard frosts, but be always exposed to the open air in mild weather.

In autumn, after the plants are come up, they should be carefully taken out of the pots or boxes; and planted in a nursery-bed, covering the surface with old tan, and afterwards they may be treated as directed for the layers.

PROPAGO, the seed of a moss, having neither tunic nor cotyledon, and consisting only of the Plumula of a naked corculum, where the rostellum is inserted into the calyx of the plant. See **SEED**.

PRUNING, in gardening and agriculture; is the lopping off the superfluous branches of trees, in order to make them bear better fruit, grow higher, or appear more regular.

Pruning, though an operation of very general use, is nevertheless rightly understood by few; nor is it to be learned by rote, but requires a strict observation of the different manners of growth of the several sorts of fruit-trees; the proper method of doing which cannot be known without carefully observing how each kind is naturally disposed to produce its fruit: for some do this on the same year's wood, as vines; others, for the most part, upon the former year's wood, as peaches, nectarines, &c. and others upon spurs which are produced upon wood of three, four, &c. to fifteen or twenty years old, as pears, plumbs, cherries, &c. therefore, in order to the right management of fruit-trees, provision should always be made to have a sufficient quantity of bearing wood in every part of the trees, and at the same time there should not be a superfluity of useless branches which would exhaust the strength of the trees, and cause them to decay in a few years.

The reasons for Pruning of fruit-trees; are, 1. To preserve them longer in a vigorous bearing state; 2. To render them more beautiful; and, 3. To cause the fruit to be larger and better tasted.

The general instructions for Pruning are as follow: the greatest care ought to be taken of fruit-trees in the spring, when they are in vigorous growth, which is the only proper season for procuring a quantity of good wood in the different parts of the tree, and for displacing all useless branches as soon as they are produced, in order that the vigour of the tree may be entirely distributed to such branches only as are designed to remain. For this reason trees ought not to be neglected in April and May, when their shoots are produced: however those branches which are intended for bearing the succeeding year should not be shortened during the time of their growth, because this would cause them to produce two lateral shoots from the eyes below the place where they were stopped, which would draw much of the strength from the buds of the first shoot: and if these two lateral shoots are not entirely cut away at the winter-pruning, they will prove injurious to the tree. This is to be chiefly understood of stone fruit and grapes; but pears and apples, being much harder, suffer not so much, though it is a great disadvantage to those also to be thus managed. It must likewise be remarked, that peaches, nectarines, apricots, cherries, and plumbs, are always in the greatest vigour when they are least maimed by the knife, for where large branches are taken off, they are subject to gum and decay; it is therefore the most prudent method to rub off all useless buds when they are first produced, and to pinch others where new shoots are wanted to supply the vacancies of the wall; by which management they may be so ordered as to want but little of the knife in winter pruning. The management of pears and apples is much the same with these trees in summer; but in winter they must be very differently pruned: for as peaches and nectarines, for the most part, produce their fruit upon the former year's wood, and must therefore have their branches shortened according to their strength, in order to produce new shoots for the succeeding year; so on the contrary, pears, apples, plumbs, and cherries, producing their fruit upon spurs, which come out of the wood of five, six and seven years old, should not be shortened, because thereby those buds which were naturally disposed to form these spurs, would produce wood branches; by which means the trees would be filled with

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wood, but would never produce much fruit. The branches of standard trees should never be shortened unless where they are very luxuriant, and by growing irregularly on one side of the tree, attract the greatest part of the sap, by which means the other parts are either unfurnished with branches, or are rendered very weak; in which case the branch should be shortened down as low as is necessary, in order to obtain more branches to fill up the hollow of the tree: but this is only to be understood of pears and apples; which will produce shoots from wood of three, four, or more years old; whereas most sorts of stone-fruit will gum and decay after such amputations: whenever this happens to stone-fruit it should be remedied by stopping or pinching those shoots in the spring, before they have obtained too much vigour, which will cause them to push out side branches; but this must be done with caution. You must also cut out all dead or decaying branches, which cause their heads to look ragged and also attract noxious particles, from the air in doing of this you should cut them close down to the place where they were produced, otherwise that part of the branch which is left will also decay, and prove equally hurtful to the rest of the tree; for it seldom happens when a branch begins to decay, that it does not die quite down to the place where it was produced, and if permitted to remain long uncut often infects some of the other parts of the tree. If the branches cut off are large, it will be very proper, after having smoothed the cut part exactly even with a knife, chisel, or hatchet, to put on a plaster of grafting clay, which will prevent the wet from soaking into the tree at the wounded part. All such branches as run a-cross each other, and occasion a confusion in the head of the tree should be cut off; and as there are frequently young vigorous shoots on old trees which rise from the old branches near the trunk, and grow upright into the head, these should be carefully cut out every year, lest, by being permitted to grow, they fill the tree too full of wood. For Pruning the roots and branches of trees in transplanting them, see the article **PLANTING**.

As to the Pruning of forest-trees, if they be large it is best not to prune them at all; yet if there be an absolute necessity, avoid taking off large boughs as much as possible. And, 1. If the bough be small, cut it smooth, close, and sloping. 2. If the branch be large and the tree old, cut it off at three or four feet from the stem. 3. If the tree grow crooked, cut it off at the crook sloping upward, and nurse up one of the most promising shoots for a new stem. 4. If the tree grow top-heavy, its head must be lightened, and that by thinning the boughs that grow out of the main branches. But if you would have them spring, rub off the buds, and shroud up the side shoots. 5. If the side bough still breaks out, and the top be able to sustain itself, give the boughs that put forth in spring a Pruning after Midsummer, cutting them close.

PSORALEA, a genus of plants, of which there are ten species. 1. *Psoralea*, with winged leaves, and flowers proceeding from the sides of the stalks. 2. *Psoralea*, with single, oval leaves. 3. *Psoralea*, with trifoliate, oval leaves, a hairy, shrubby stalk, and flowers terminating the branches. 4. *Psoralea*, with silvery winged leaves, trailing stalks, and flowers proceeding from the sides of the stalks. 5. *Psoralea*, with winged leaves, a climbing stalk, and flowers sitting close at the wings of the stalk. 6. *Psoralea*, with trifoliate leaves, a very branching, shrubby stalk, and flowers growing in heads. 7. *Psoralea*, with winged leaves, and flowers growing in spikes. 8. *Psoralea*, with winged leaves, having hairy, round lobes, flowers growing in heads from the wings of the leaves, and at the ends of the branches, and a shrubby stalk. 9. *Psoralea*, with trifoliate leaves, having oval lobes, and flowers growing in heads on very long foot-stalks. 10. *Psoralea*, with trifoliate leaves, having oval, spear-shaped lobes, and flowers growing in heads upon long foot-stalks.

The first species is a native of the Cape of Good Hope. The second of India. The third, seventh, and eighth

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eight species grow naturally at La Vera Cruz. The fourth is a native of Malabar. The fifth and sixth sorts grow naturally at Campeachy. The ninth in the south of France and Italy, and the tenth is a native of Jamaica and Sicily.

Culture of the Psoralea.

The first species is propagated by seeds, which should be sown upon a moderate hot-bed, and when the plants come up, they must have a large share of air admitted to them. When they are fit to remove they should be planted in separate small pots, filled with light earth, and plunged again into the bed, shading them from the sun till they have taken new root, then they should be gradually inured to the open air, into which they should be removed towards the end of May, and kept abroad till October, at which time they must be placed in the green-house, and treated like other plants from the same country.

The second, fourth, and seventh species are propagated by seeds, which must be sown upon a hot-bed in the spring, and when the plants are fit to remove, they should be each planted into separate small pots, filled with light earth, and plunged into a moderate hot-bed, shading them from the sun till they have taken new root, after which they must have free air admitted to them in warm weather.

When the plants have filled the pots with their roots, they should be removed into larger, and the beginning of July they may be placed in an airy glass-case, where they may be defended from cold, but have free air in warm weather.

The third, fifth, sixth, and eighth species are propagated by seeds, sown upon a hot-bed, and the plants must be treated in the same manner as the second sort: but they must be removed into the stove in autumn, and kept in a moderate warmth all the winter, and in summer they must have a large share of air, but should constantly remain in the stove.

The ninth and tenth species are propagated by seeds, which should be sown on a bed of light earth in April, and in May the plants will come up, when they should be kept clean from weeds, and as soon as they are fit to remove, they should be transplanted.

The plants of the ninth sort will live through the winter in the open air, if they are planted in a warm, dry border: but those of the tenth species must be planted in pots and placed under a common frame in winter, where they may be screened from severe frost.

PTARMICA, a species of Achillea. See the article **ACHILLEA**.

PTARMICA, a species of Eternal Flower. See **Eternal Flower**.

PUMPKIN, or **POMPION**, a species of the Gourd. See the article **GOURD**.

PURSLAIN, *Portulaca*, a genus of plants, ranged by Linnæus among the *decandria monogynia*, and of which there are three species. 1. Purslain, with wedge-shaped leaves, and flowers growing close to the stalks. 2. Purslain, with oval, gibbous leaves, foot-stalks having many flowers, and a shrubby stalk. 3. Purslain, with awl-shaped leaves placed alternately, hairy joints, and flowers sitting close to the stalks.

The first species is the common Purslain, a plant so well known as to need no description. It is a native of most of the hot parts of the globe. There are three varieties of it: one with deep green leaves, one with yellow leaves, commonly called golden Purslain, and the third with small succulent leaves, called wild Purslain.

The second species is a native of the Cape of Good Hope. The root is white and fibrous. The stalk is round, upright, thick, but of a tender substance: at the bottom it is strongly tinged with red, but upwards its colour is a bright silvery green. The leaves stand thick upon it from the bottom to the top: they have no foot-stalks, but adhere by a narrow base, from which they grow broader to the extremity. Their colour is a bright fresh green, and they have a thick, juicy substance: at the end they are rounded and broad, and frequently they have in that part a heart-like dent; the

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middle rib, more particularly in the lower leaves, is large and conspicuous, and its colour is usually reddish, especially towards the base. The flowers cover the top of the plant in a large loose head. The main stalk divides in this part into a vast number of branches, and on each there are many flowers: they spread out wide every way, and there are all down them flowers on slender reddish foot-stalks, at distances. The flowers themselves are of a snowy white, sometimes tinged with a blush of flesh-colour.

The third species is a native of South-America. The root is composed of many long white fibres. The stalks are numerous, weak, glossy, lightly hairy, and thrown about in various directions; some upright, some oblique, and others lying on the ground. Their colour is naturally a pale green, but they are often stained with purple. The leaves are numerous, and placed alternately: they are long, narrow, sharp-pointed, of a pale but fresh and pleasing green, and glossy as the stalks. The flowers terminate the stalks, and often rise also from the bosoms of the leaves, sometimes singly, sometimes two or three together. They are not large, but very conspicuous from their position and colour, they stick close by the bases to the stalk: the colour of the petals is a delicate crimson, the buttons are yellow, and the heads of the style purple. Round about those which terminate the stalks, there stand eight or more leaves, like the others in form, but disposed as the rays of a star; and about the bases of these, and in the angles made by the others with the stalk, there is usually a light cottony matter.

Culture of the Purslain.

The first species is propagated by seeds, which should be sown upon beds of light earth, during any of the summer months. It requires no other culture than to be kept clear from weeds, and in dry weather to be watered two or three times a week.

The second species is propagated by seeds, which should be sown on a hot-bed, and when the plants have acquired some strength, they must be transplanted into a second, and thence into a third hot-bed; after which as many as are intended to be preserved, must be transplanted into separate pots of rich garden-mould. Let them be frequently watered, and kept under a hot-bed frame, till they are well strengthened in the new earth: then let them be set out with the other green-house plants, where they may remain till autumn, at which time they must be removed into the green-house, where they will flower in perfection, and their leaves will give a fine variety.

The seeds of the third species must be sown in February in a pot of rich garden-mould, and plunged to the rim in a bark-bed. When the plants rise, they must be thinned, and afterwards two or three of the finest may be planted out into separate pots, which must be removed into the stove, and there treated in common with the other plants, suffering them to grow their own way; in which some of the branches will fall down, and cover the whole pots.

See **PURSLAIN-TREE**, a species of Orach. See the article **ORACH**.

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QUAMOCLIT. See the article **IPOMOEA**.

QUEEN of the Meadows, a species of *Spiræa*. See the article **SPIRÆA**.

QUEEN'S Gilli-Flower. See the article **ROCKET**.

QUICK, or **QUICKSET HEDGE**, all live hedges, of whatever sort of plants they are composed, to distinguish them from dead hedges: but, in a more strict sense of the word, it is restrained to those planted with the hawthorn, or *mesphylus sylvestris*; under which name these

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these young plants, or sets, are sold by the nursery-gardeners who raise them for sale.

QUICKBEAM, or **QUICKEN**, a species of the Service-Tree. See the article **SERVICE-TREE**.

QUINCE-TREE, *Cydonia*, according to Linnæus, a species of the *Pyrus* or Pear-tree, but considered by other authors as a distinct genus, of which there are three sorts: 1. The Pear-Quince. 2. The Apple-Quince. 3. The Portugal Quince.

Culture of the QUINCE-TREE.

The several sorts of this tree are easily propagated, either by layers, suckers, or cuttings, which must be planted in a moist soil. Those raised from suckers are seldom so well rooted as the others, and are subject to produce suckers again, in a greater abundance, which is not to be wished in fruit-bearing trees.

The cuttings should be planted early in the autumn, and, in dry weather, must be often watered, to assist them in rooting: the second year they should be removed into the nursery, and set in rows, at three feet distance, and one foot asunder in each row. In two or three years more, they will be fit to transplant where they are to stand, which should always be near a ditch or river, or in some moist soil; where they will produce twice the quantity of fruit that they will in a dry one, and it will also be much larger: but those in a drier soil are better tasted, and are earlier ripe.

Dwarf QUINCE, a species of Medlar. See the article **MEDLAR**.

QUINCUNX ORDER, in gardening, a plantation of trees, disposed originally in a square; and consisting of five trees, one at each corner, and a fifth in the middle: or a Quincunx is the figure of a plantation of trees disposed in several rows, both length and breadth-ways, in such a manner, that the first tree in the second row commences in the centre of the square formed by the two first trees in the first row, and the two first in the third, resembling the figure of the five at cards. This disposition of trees was formerly much more regarded than at present; but is still much used in France, for planting trees to form a grove, and is expressed in the following form:

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RACEMUS, a stalk divided or branched into several footstalks, sustaining the flowers; or fruits set together, as the bunches of grapes, currans, &c.

RADIATED FLOWERS, are such as have several semi-florescences set round a disk, in form of a radiant star; those which have no such rays are called Discous flowers.

RADICLE, that part of the seeds of all plants which, upon vegetating, becomes its root.

RADISH, *Raphanus*, a genus of plants ranged by Linnæus among the *tetradynamia siliquosa*, and of which there are three species; but as there is only one of them cultivated in our gardens, namely, the garden radish, it will be needless to describe them.

There are several varieties of the root of the common garden Radish, viz. The small topped Radish, the deep red Radish, the striped Radish, &c. all of which arise from culture. The small topped is the kind, the seed of which is most saved, and which is most valued about London, because it does not take up much room.

Culture of the RADISH.

Radishes are sown at various seasons, but the earliest is generally at the latter end of October; if they are not destroyed by frost; they become fit to eat in March. These are commonly sown about walls, pales or hedges, where they may have some defence against the cold. The

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second sowing is commonly about Christmas, if the weather is mild enough to let the ground be worked. These are also to be sown under shelter, and, if they are not destroyed, will be fit to eat in April; and to have a constant supply, there should be a new sowing every fortnight, from the middle of January to the beginning of April. The latter crops should be sown in a moist soil, and an open situation.

Horse RADISH. See the article **HORSE-RADISH**.

RAGGED ROBIN, a species of *Lychnis*. See **LYCHNIS**.

RAGWORT, *Othonna*. See the article **OTHONNA**.

RAMPION, *Rapunculus*, a genus of plants of which there are six species: 1. Rampion with the lower leaves heart-shaped, and an oblong spike of flowers. 2. Rampion with indented leaves, those at the bottom heart-shaped, and flowers growing in bunches. 3. Rampion with linear, entire leaves. 4. Rampion with spear-shaped leaves. 5. Rampion with sawed leaves, the lower ones of which are heart-shaped. 6. Rampion with obtuse leaves.

These are all hardy plants, and natives of different parts of Europe.

Culture of the RAMPION.

All the species are propagated by seeds, which should be sown in autumn, for if they are kept out of the ground till the spring, they frequently fail. They should be sown on a bed of fresh undunged earth, where they are designed to remain; small drills should be made cross the bed at eighteen inches distance, wherein the seeds should be sown; and then covered over very lightly.

The following spring the plants will come up, when they must be frequently weeded and thinned, so as to leave them six or seven inches apart in the rows, which is all the culture they require.

RAMPIONS, or **CARDINAL FLOWER**. See the article **CARDINAL FLOWER**.

RAMPION, a species of *Campanula*. See the article **CAMPANULA**.

RANDIA, a genus of plants of which there is only one species.

This plant is a native of La Vera Cruz. It rises with a shrubby stalk twelve feet high. The branches grow in pairs from the sides of the stalks, each pair crossing the other. The leaves stand upon short footstalks, they are round, a little indented at the top, and of a thick consistence. The flowers are placed on the sides of the branches, they are small, white, tubulous, and slightly divided at the brim into five segments. These are succeeded by oval berries, about the size of a marble.

Culture of the RANDIA.

It is propagated by seeds, which should be sown in pots early in the spring, and plunged into a hot-bed of tanners bark.

When the plants come up, they must have fresh air admitted to them always when the weather is warm. In about a month they will be fit to transplant, when they should be carefully shaken out of the pots, and each planted into a separate small pot, and then plunged into the hot-bed again, where they must be shaded from the sun till they have taken fresh root, after which they must have air and water in proportion to the warmth of the season.

The plants may remain in the hot-bed till Michaelmas, at which time they should be removed into the stove, where they must be kept the two first years in a moderate temperature of heat, always observing to wash their leaves whenever they contract filth. The third summer they may be exposed to the open air, in a warm situation for two or three months, but in winter they must be again removed into the stove, where their leaves continue green all the year, and make a most agreeable variety.

RANUNCULUS, *Crowfoot*, a genus of plants ranged by Linnæus among the *polyandria polygynia*, and of which there are no less than thirty-seven species, many of them common weeds in this country, and most of the others growing

growing wild in several parts of Europe. From the species of this plant cultivated in our gardens several beautiful varieties have been raised, which it would be needless to particularize: we shall therefore confine ourselves to four, viz:

Double White Ranunculus.

Proliferous Mountain Ranunculus.

Golden Proliferous Ranunculus.

Oriental Meadow Ranunculus.

Double White RANUNCULUS. The root of this plant is composed of numerous thick spreading fibres, which rise as it were immediately from the base of the stalk, without any head. The first leaves are supported on long foot-stalks, and are of a deep but elegant green: they are divided to the base into five parts, and these are oblong, broadest toward the middle, sharp-pointed, deeply jagged, and notched at the edges. The stalk is round, thick, and branched, two feet and a half high, of a pale, whitish green, and often stained with brown. The leaves on this are like those from the root, only smaller, and they stand irregularly. The flowers terminate the branches, and are very numerous and elegant: they are composed of several small, curled, and waved petals of a snowy whiteness.

Culture of this RANUNCULUS.

It is propagated by parting of the roots, the proper time for doing which is in autumn: and toward the season of their flowering, let them have frequent moderate waterings. The flowers must be taken off as they fade, and new ones will be thus produced in abundance most part of the summer.

Proliferous Mountain RANUNCULUS. This plant has a root formed of several oblong tuberous pieces. The leaves spread in clusters upon the ground, and have short foot-stalks; these are white with a light tinge of green: the leaves themselves are of a pale pleasing green, with a few straggling whitish veins, which are very conspicuous on the under-side, and the leaves often rise into a kind of soft lumps or tubercles between them. The shape of the leaf is oval: it is a little hollowed in the broad part for the stalk, and grows narrower to a point: the edges are beautifully serrated; among these rise the stalks: they are numerous, slender, of a whitish green, but tinged a little with red toward the base, and about four inches high: no leaves grow on these, each supports one flower, which in the state of nature is large, yellow, formed of five petals, with a great cluster of filaments in the middle, and of a light fragrance. But in this, as in all flowers, culture adds greatly to the natural beauty of it; on the top of each stalk, as it first rises from the root, appears a green oval button, tipped with gold: this, as the small stalk rises in height, swells and expands, till by degrees it grows in the full lustre of a double flower composed of multitudes of narrow and sharp-pointed petals in various circular series, and all of a delicate yellow. In the midst are buried some fine threads with thin buttons, which impregnate the rudiments of many seeds, appearing afterwards in an oblong cluster. In this state the flower has great beauty and singularity of aspect: the pointed form of the petals giving it this peculiarity.

But this is far from that state of lustre to which this flower may be brought, for where the soil suits, and no neglect of the gardener prevents, there will in the most vigorous plants appear on some stalks proliferous flowers. In these the first structure is the same as in the others, but from the centre there rises a small stalk, supporting on its top a representation in miniature of the first flower, but the colour is fainter: the bottom, where it joins the stalk, is white; the first series of petals are also white, tipped with green, and tinged with a little yellow, and the rest are of a fainter yellow than those in the original or lower flower.

Culture of this RANUNCULUS.

It may be raised from parted roots, but it is best produced from seeds; these rarely ripen in the proliferous flowers, but as there are usually some which are not proliferous from the same root with those which are, let the

gardener save his seeds from these, and for this purpose he must cut off the proliferous flowers from such a plant as soon as they shew their nature, and then digging about the root and gently watering it, raise the other flowers to the most full perfection for ripening the seeds. As soon as the heads change colour, they must be cut off, and laid on a papered shelf, and the seeds will fall out when they begin to dry; they must then be spread to harden more perfectly, and after ten days they may be tied up in paper bags till the proper season for sowing them.

The last week in August dig up a border in a warm part of the garden, cover it five inches with fresh mould; from a dry rich pasture, and scatter on the seeds; sift over them a quarter of an inch of any of the light composts, and lay some pieces of furze-bush upon the ground.

The succeeding spring, when the plants have some little strength, thin them by taking up the weakest, and planting them in other parts of the garden, leaving the others at eight inches distance in their original bed, from which they are never to be removed till the roots want parting.

Golden Proliferous RANUNCULUS. The root of this plant is tuberous and irregular, formed of several oblong pieces, with a few thick fibres. The first leaves are numerous; they spread variously from one head, some erect, and others on the ground: they are differently divided according to their growth and size, but always into threes; the segments are oblong and notched at the edges. The stalk is a foot high, round, of a pale green, somewhat hairy, and tolerably firm; there are two or three leaves upon it divided in the same manner as those from the root, lightly hairy, and of a pale green. The top supports a large and very elegant flower, composed of almost innumerable petals, and of a bright gold yellow; from the centre rises a slender green stalk, an inch and a half in length, supporting on its summit a smaller flower, perfectly resembling the larger.

Culture of this RANUNCULUS.

It may be propagated either by parting the roots in the common method, or by seeds.

If from seeds the gardener must save them from a semi-double flower of the plain yellow kind, observing to fix on one that has a good firm stalk, and is every way of strong and vigorous growth; let these be ripened with care, well hardened: and in August they must be sown in a part of the garden open to the morning sun, first digging the mould out, and filling up its place with a compost of three parts light pasture-earth, and one part old cow-dung: on this sow the seeds evenly, and cover them a quarter of an inch with the same compost.

In the depth of winter let a mat be drawn over the bed, supported by low hoops, and at all times keep the surface clean from weeds, and carefully watered. The plants will flower the second year, when there will be many very noble flowers of the more usual kinds, and probably some of this proliferous sort; they must be taken up when the leaves are faded, and in autumn planted amongst the choicest kinds.

If the gardener should not obtain this Ranunculus from one sowing he will from another, and there will always be new, and beautiful flowers rise from every sowing to reward his labour.

Oriental Meadow RANUNCULUS. This plant has a root composed of numerous long fibres, connected to a small head. The first leaves have long hollowed foot-stalks: they are large, and divided into a multitude of long narrow segments, they are of a tough substance, covered with a white, loose, cottony matter, and their colour is a greyish green. The stalk is a foot high, upright, round, and divided into a few branches. The leaves stand alternately on this, and resemble those from the root, by their division into numerous, long, and narrow parts. Their colour is the same whitish green with that of the others, and they are covered with the like cottony matter. The flowers terminate the stalks and

and branches, and several are supported also on slender foot-stalks, rising from the bosoms of the upper leaves. Their colour is a beautiful, but not strong yellow.

Culture of this RANUNCULUS.

It is propagated by seeds, which must be saved from a strong plant. It should be marked while in flower, and all the flowers and buds, except three or four, cut off, and if there should chance to be a flower with more than five petals, let that be certainly one of those saved for seed: let the ground be cleared of weeds and other plants, of whatever kind, for a yard round about this, and once in four days break the surface well with a trowel, not going so deep as to disturb the roots. Let the stalks which have flowers on them be tied up to sticks, and every evening give the plant a gentle watering: let this be continued till the flowers are fallen, and the heads of the seeds have their full bigness: then give no more water, but leave the seeds to harden upon the stalk. When they begin to be loose, carefully cut off the heads, and lay them to dry upon a papered shelf.

The latter end of August chuse a part of the nursery that is not too much exposed to the sun, and taking out the mould from a small piece, throw in the following compost five inches thick:

A bushel of rich meadow earth, taken from under the turf where there is some moisture: three pecks of pond-mud, two of rotted cow-dung, and two quarts of coarse sand.

Scatter the seeds over the surface, and sift upon them a third of an inch of the same mould: lay a piece of hawthorn over the bed, after which all the care it will require will be weeding in common with the other ground, and if the surface should grow dry, a gentle watering. When the young plants appear they must be watered more frequently, and thinned where they stand too close.

In the middle of April let another bed of the same compost be prepared for them: take them out of the seed-bed, and plant them regularly in this, at seven inches distance: here let them stand till autumn, and when they shew the signs of sending up a stalk for flowering, let it be cut off in time, for the whole business now is to strengthen the roots.

In autumn prepare a third bed of the same compost, and transplant them again at ten inches distance: cover them in the hard frosts, and the next year let them flower, without any other removal.

The seeds of the semi-double flowers must be saved and sown again in the same manner; and when a double flower is once obtained, the propagation of it will be easy by parting of the roots in autumn.

Globe RANUNCULUS, *Trollius*, a genus of plants, ranged by Linnæus among the *polyandria polyginia*, and of which there are only two species. 1. *Globe Ranunculus*, with connivent corollæ and nectaria, of the length of the stamina, commonly called *Locker Gow-lans*. 2. *Globe Ranunculus*, with patent flowers, and nectaria the length of the petals.

Both these plants have perennial roots: the first species is a native of England, Sweden, and Germany, and the second grows naturally in Siberia and Cappadocia.

Culture of the Globe RANUNCULUS.

Both the species are propagated by parting of the roots about the end of September, when the leaves begin to decay: they should be planted at a foot distance from each other, and require a moist soil and a shady situation.

The second sort succeeds best on a north border, where the soil is loamy, but not stiff.

RAPE, *COLESEED*, or *NAVEW*, a species of the *Cabbage* or *Brassica*, is propagated in the fields, in many parts of England, to great advantage, for the oil expressed from the seeds, as well as for feeding of cattle: but never being cultivated in gardens, renders it a subject improper for this work.

RASPBERRY, or *Bramble BUSH*, *Rubus*, a genus of plants, ranged by Linnæus among the *icofandria polygamia*, and of which there are ten species, most of them growing wild in the hedges all over England: but the species generally cultivated in gardens is *Raspberry-bush*

with winged leaves, furnished with five and three lobes, a prickly stalk, and channelled foot-stalks: of this there are three varieties. 1. The common *Raspberry*. 2. The late red *Raspberry*; and 3. The white *Raspberry*.

Culture of the RASPBERRY-BUSH.

These shrubs send up great plenty of suckers from their roots, and are very easily propagated by them.

They should be taken up in October, and before they are re-planted their fibres should be shortened: but the buds, which are at a small distance from the stem of the plant, must not be cut off, because these produce new shoots the next summer.

They should be planted two feet asunder, and set in rows, which should be five feet distance from one another; they thrive best in a fresh sandy loam, which should neither be too moist nor over dry.

The time for dressing them is October, when all the old wood which produced fruit the succeeding summer should be cut down to the ground, and the young shoots shortened to about two feet in length. The spaces between the rows should then be dug up, and some rotten dung buried in them. In the summer they must be kept clean from weeds, and once in three or four years there should be new beds made, and the old ones destroyed, for they seldom bear well after that time.

Scnaga RATTLE SNAKE WORT, a species of *Milk-wort*. See the article *MILK-WORT*.

RATTLE SNAKE WEED, a species of *Eringo*. See *ERINGO*.

RAUVOLFIA, a genus of plants, of which there are only two species. 1. *Rauvolfia*, with four spear-shaped, entire leaves at each joint. 2. *Rauvolfia*, with oval, spear-shaped leaves, somewhat indented.

Both these species are natives of the warmest parts of America: they flower most part of the summer, and the fruit, which is a round black-berry, ripens in autumn and winter.

Culture of the RAUVOLFIA.

These plants are propagated by seeds, which should be sown in autumn soon after they are ripe, in pots, and plunged into a hot-bed of tanners-bark; these pots must be shifted from one bed to another as the heat decays, till the plants appear, which, as the seeds are very hard, will be some time first.

When the plants come up, they should have a large share of fresh air admitted to them in warm weather, and but little water. When they are two inches high they must each be transplanted into a separate small pot, and plunged into the hot-bed again, where they must be shaded from the sun till they have taken new root, after which they should be allowed fresh air in proportion to the warmth of the season. In this hot-bed the plants may remain till toward Michaelmas, when they should be removed into the stove, and plunged into the tan-bed, where they should constantly remain, and not have too much water in cold weather.

In summer they must always have a great quantity of air, and the leaves must be now and then washed with a sponge to clear them from the filth they are apt to contract.

They may also be propagated by cuttings, which should be laid to dry for two or three days before they are planted, and then should be plunged into a moderate hot-bed of tanners-bark, where they must be shaded till they have taken root, after which they may be treated as the seedling plants.

RAY, *Radius*, several semi-florets set round the disk of a flower. See the article *DISK*.

RECEPTACLE, *Receptaculum*, that part of the plant to which the flower of the fruit adheres: this is a part of a very various figure, in the various genera.

REDWOOD, a species of *Cearothus*.

This plant is a native of the American islands. It rises with a shrubby stalk eighteen or twenty feet high, sending out several horizontal branches. The leaves are oval and veined. The flowers grow from the wings of the leaves, having very short foot-stalks: they are of a white herbaceous colour.

Culture of the REDWOOD.

It is propagated by seeds, which must be sown upon a hot-bed in the spring; and when the plants are fit to remove, they should be each planted into a separate small pot filled with light sandy earth, and plunged into a hot-bed of tanners-bark, where they must be shaded till they have taken root, after which they must be treated in the same manner as other tender exotics. In the autumn they must be placed in the bark-stove, and during the winter watered with great caution, for too much moisture at that season will destroy them.

REED, *Arundo*, a genus of plants, ranged by Linnæus among the *triandria digynia*, and of which there are six species. 1. Reed tree, or Bambo, or Bambu. 2. Reed, with three flowers in each cup, growing in diffused panicles. 3. Reed, with five flowers in each cup, growing in loose panicles; or the common Marsh Reed. 4. Reed, with one flower in each cup, growing in an erect panicle, and leaves smooth on the under side. 5. Reed, with one flower in each cup, and a branched stalk. 6. Reed, with one flower in each cup, and involute, pointed, pungent leaves.

The first species is a native of both the Indies; the second grows naturally in France and Spain; the third in marshy places in this country, and other parts of Europe; and the fourth, fifth, and sixth sorts are all natives of different parts of Europe.

Culture of the REED.

The first species is propagated by slips from the root, and must be planted in tubs lined with rich earth, and plunged into the tan-bed of the bark-stove, where they must be preserved: and when the tubs decay, the plants must be permitted to root in the tan.

The second species is propagated by parting the roots early in the spring, before they begin to shoot, and will, in a year or two, if the ground is good, make very large shoots, from each of which there may be twenty or thirty canes produced.

The other four species are never cultivated, except in botanic gardens for the sake of variety.

Flowering or Indian REED, or CANE. See the article *Indian Flowering CANE*.

REST-HARROW, CAMMOCK, or PETTY-WHIN, *Ononis*, a genus of plants ranged by Linnæus among the *diadelphia decandria*, of which there are twelve species: and of these the following seven are cultivated in gardens.

1. Rest-harrow, with flowers sitting close on the sides of the stalks, with all the leaves trifoliate, growing upon foot-stalks, and bristly stipulæ. 2. Rest-harrow, with leafy spikes, and single, obtuse leaves. 3. Rest-harrow, with one flower on a foot-stalk, terminated by a thread, and with trifoliate leaves. 4. Rest-harrow, with two flowers on a foot-stalk, terminated by a thread. 5. Rest-harrow, with trifoliate, fleshy leaves, which are narrow, and have three indentures. 6. Rest-harrow, with paniculated flowers, generally growing three upon a foot-stalk, sheath-like stipulæ, and trifoliate leaves. 7. Rest-harrow, with naked foot-stalks proceeding from the sides of the branches, sustaining three flowers, and trifoliate leaves.

The first species is a native of France and Italy. The second of Sicily, Spain, and Portugal. The third of France and Spain. The fourth grows naturally in Sicily. The fifth in Spain. The sixth on the Alps; and the seventh in Switzerland.

Culture of the REST-HARROW.

The first, second, and fourth species are easily propagated by seeds, which should be sown in the places where the plants are to remain. They require no other care than to be thinned where they grow too close, and to be kept clean from weeds.

The seeds of the third species should be sown in drills, upon a bed of light earth. When the plants come up they must be kept clean from weeds, and in autumn carefully taken up, and transplanted into the borders of the pleasure-garden, where they are to remain.

The fifth, sixth, and seventh species are also propagated by seeds, which should be sown in April, upon a bed of light earth. In May the plants will come up,

when they must be kept clear from weeds till the following autumn, and then transplanted to the places where they are to remain.

The fifth species requires a warm situation, and must always be protected from the frost.

RHAMNUS, *Buckthorn*, a genus of plants ranged by Linnæus among the *pentandria monogynia*; there are four species of it, but one of them only is worth cultivating in gardens.

This plant is a native of the Cape of Good Hope. It rises with a shrubby stalk to the height of five feet. The branches, when young, are covered with a green bark, which afterwards becomes brown. The leaves are wedge-shaped: these grow at each joint, four, five, and sometimes six, rising from the same point; they are of a deep green, and continue so all the year, which renders it very valuable in winter. The flowers, which are white, grow in bunches: they have short tubes, and their upper part is cut into five acute segments, which spread open in form of a star. In June the whole shrub seems covered with these flowers, which make a most elegant and beautiful appearance. This shrub does not ripen seeds in England.

Culture of the RHAMNUS.

It is easily propagated by cuttings, which should be planted in pots the beginning of April, and plunged into a moderate hot-bed, where they must be shaded from the sun, and have very little water. In about six weeks they will have taken root, when by degrees they should be inured to the open air, into which they must be removed soon after.

When they are well hardened they may be shaken out of the pots and separated, observing to preserve a ball of earth to each, and plant them into separate pots, placing them in the shade till they have taken new root. They may remain abroad, in a sheltered situation, till the autumn, at which time they must be housed, and treated in the same manner as Myrtles, and other hardy greenhouse plants.

RHAPONTIC-ROOT, a species of Rhubarb. See RHUBARB.

RHEXIA, a genus of plants, of which there are only two species. 1. Rhexia, with hairy leaves. 2. Rhexia, with smooth empalements.

The first species is a native of Maryland, and the second of Virginia.

Culture of the RHEXIA.

Both these species are propagated by seeds, which must be procured from the places where they grow naturally. These should be sown, as soon as they arrive, in pots filled with light earth: if they are sown before the spring, and placed under a garden-frame to protect them from frosts, the plants will come up the spring following: but when they are sown in the spring, the plants seldom come up the first year.

When the plants are fit to be removed, they should be transplanted into separate pots: and in very severe weather they must be sheltered under a frame. The second year the plants will flower.

RHUBARB, *Rheum*, a genus of plants ranged by Linnæus among the *enneandria trigynia*, and of which there are three species. 1. Rhubarb, with smooth leaves, and foot-stalks somewhat furrowed; or the Rhapontic or English Rhubarb. 2. Rhubarb, with hairy leaves, and equal foot-stalks; or the true Rhubarb. 3. Rhubarb, with granulated leaves, and equal foot-stalks; called by the Arabians Ribes.

The first species is a native of Thrace and Scythia, and has long been an inhabitant of the English gardens. The second grows naturally in China and Siberia; and the third is a native of Persia and Syria.

Culture of the RHUBARB.

These plants are all propagated by seeds, which should be sown in autumn soon after they are ripe, in the places where the plants are designed to remain.

When the plants appear in the spring, the ground should be hoed over to cut up the weeds, and they should be thinned so as to stand at the distance of six or eight inches asunder. Some time after they must be hoed

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hoed again, and thinned to the distance of two feet, after which they only require the common care of being kept clear from weeds.

They delight in a rich soil, not too dry nor over moist.

RIBES, a species of Rhubarb. See the last article.

RICINUS, or **PALMA CHRISTI**, a genus of plants, of which there are eight species. 1. Ricinus, with target-shaped, sawed leaves, which are grey on their under side, and foot-stalks bearing glands. 2. Ricinus, with target-shaped leaves, which are somewhat sawed, and green on both sides. 3. Ricinus, with target-shaped leaves, which are unequally sawed. 4. Palma Christi, with target-shaped, sawed leaves, and rough capsules to the fruit. 5. Ricinus, with target-shaped, sawed leaves, a jointed stalk, and prickly covers to the seeds. 6. Palma Christi, with sawed, target-shaped leaves, a jointed stalk, and smooth covers to the seeds. 7. Ricinus, with hand-shaped, sawed leaves, which are deeply divided, and prickly covers to the seeds. 8. Palma Christi, with hand-shaped, sawed leaves, and smooth covers to the seeds.

The first species is a native of Sicily, and other warm parts of Europe. The second and third of the West-Indies. The fourth and fifth sorts grow naturally in both Indies. The sixth and eighth in the Spanish West-Indies; and the seventh in Carolina and several other parts of North America.

Culture of the RICINUS.

These plants are all propagated by seeds, which must be sown upon a hot-bed in the spring: and when the plants are come up, they must be each transplanted into a separate pot, and plunged into a fresh hot-bed. When their roots have filled these pots, which they will soon do, the plants must be shifted into larger, which must be done from time to time as occasion shall require. In June they may be hardened by degrees to the open air, into which they may be removed soon after, placing them in a warm situation, where they may remain till the middle or end of October, when they must be housed with other hardy exotics; they must have very little water in winter, and a great share of fresh air admitted to them when the weather is mild.

Some of the plants, at the time of first transplanting them, may be shook out of the pots, and planted out into a very rich border, where, if regularly watered in dry weather, they will grow to a very large size.

Bastard RICINUS, *Croton*, a genus of plants ranged by Linnæus among the *monoecia monodelphia*, and of which there are nine species. 1. Bastard Ricinus, with rhomboid, spreading leaves, pendulous capsules, and an herbaceous stalk. 2. Bastard Ricinus, with oblong, sawed leaves. 3. Bastard Ricinus, with trifid, or quinquefid, sawed leaves. 4. Bastard Ricinus, with oblong, pointed leaves, and an herbaceous stalk. 5. Bastard Ricinus, with a laurel leaf, and a very large green empalement to the flower. 6. Bastard Ricinus, with hairy leaves. 7. Bastard Ricinus, with narrow leaves, which are white on their under side, commonly called Spanish Rosemary in Jamaica. 8. Bastard Ricinus, with a marshmallow leaf. 9. Bastard Ricinus, with roundish, sawed leaves, silvery on their under side.

The first species grows naturally in the south of France. The second and third are natives of La Vera Cruz. The fourth of the Havannah. The fifth, sixth, seventh, and eighth are all natives of Jamaica; and the ninth grows naturally at Campeachy.

Culture of the Bastard RICINUS.

The first species is propagated by seeds, which should be sown early in the spring, on a border of light earth in a warm situation, where it is designed to remain. When the plants come up they should be thinned, so as to be left at the distance of eight inches asunder; after which they will require no other care but to be kept clean from weeds.

All the other species are propagated by seeds: those of the fifth, seventh, and eighth species must be procured from the places where they grow naturally, for they very seldom perfect them here.

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The seeds must be sown on a hot-bed early in the spring, and when the plants are fit to remove, they should be each transplanted into a small pot, and plunged into a moderate hot-bed of tanners-bark, where they must be shaded from the sun till they have taken fresh root, after which the air must be admitted to them in proportion to the warmth of the season.

After the plants are grown too tall to remain in the frames, they should be removed either into the stove or a glass-case, where there is a hot-bed of tanners-bark, into which the pots should be plunged, where all but the fifth, seventh, and eighth species will flower and perfect their seeds: but these three must be removed into the bark-stove in the autumn, and during the winter season they should have but little water.

RIVINIA, a genus of plants which has no English name, ranged by Linnæus among the *tetrandria monogynia*, and of which there are only two species. 1. Rivinia, with spear-shaped, entire leaves, and a shrubby, branching stalk. 2. Rivinia, with nightshade leaves.

The first species is a native of Jamaica, and the second of Antigua.

Culture of the RIVINIA.

Both these species are propagated by seeds, which should be sown in pots, and plunged into a moderate hot-bed. Before winter these pots should be removed into the stove, and plunged into the tan-bed, where the earth must be sometimes refreshed with a little water, but never made too moist.

In the spring the pots may be taken out of the stove, and plunged into a fresh hot-bed to bring up the plants: but if they should not rise the earth must not be disturbed, for they may come up the following spring.

When the plants come up and are fit to remove, they should be each transplanted into a separate small pot, plunged into a hot-bed, and treated in every respect like other plants from the same countries.

ROAN-TREE, a species of the Service-tree. See the article SERVICE-TREE.

Ragged ROBIN, a species of *Lychnis*. See *LYCHNIS*.

Wake ROBIN. See the article *ARUM*.

ROBINIA, *Falfe Acacia*, a genus of plants ranged by Linnæus among the *diadelphia decandria*, and of which there are five species. 1. Robinia, with foot-stalks supporting bunches of flowers, and with unequal winged leaves. 2. Robinia, with subdivided foot-stalks, winged leaves, and flowers larger than the lobes. 3. Robinia, with single foot-stalks, and leaves abruptly winged. 4. Robinia, with single foot-stalks, and leaves growing by fours upon foot-stalks. 5. Robinia, with single stalks, and sessile leaves growing by fours.

The first species is a native of North America, where it grows to a very large size, and the wood is much valued for its duration. The second sort grows naturally in India; and the third, fourth, and fifth species are natives of Siberia, and some parts of Tartary.

Culture of the ROBINIA.

The first, third, fourth, and fifth species are propagated by seeds, which should be sown in spring or autumn, upon a bed of light earth. When the plants are come up they will require no other care but to keep them clean from weeds till they have gathered some strength, when they should be transplanted into a nursery, and placed in rows three feet distance, and a foot and a half distant in the rows: here let them remain two years, by which time they will be fit to transplant into the places where they are designed to stand.

They may also be propagated by suckers taken from the roots of the old trees.

The second species is propagated by seeds, which should be sown in small pots and plunged into a hot-bed of tanners-bark. In about two months the plants will appear; when they have acquired a little strength they must be carefully shaken out of the pots, and their roots separated, putting each plant into a small pot, and plunge them into a hot-bed of tanners-bark, where they must be treated like other tender plants from the same countries.

ROCKET,

ROCKET, *Eruca*, a species of the Cabbage or Brassica.

Culture of the ROCKET.

If this plant is propagated for fallads, it should be sown in drills, in the same manner as is usually practised for all other fallad herbs.

When it is cultivated for the seeds, which are sometimes used in medicine, it should be sown in March on an open spot of ground; and when the plants have put out four leaves, they should be hoed to destroy the weeds, and thinned so as to be left at the distance of three or four inches asunder. In about five weeks after the ground should be a second time hoed: and when the seeds are ripe the plants should be drawn up and spread out upon a cloth for a few days to dry, and then the seeds are to be beat out of the pods and put up for use.

ROCKET, DAME'S VIOLET, or QUEENS GILLIFLOWER, *Hesperis*, a genus of plants ranged by Linnæus among the *tetradynimia filiquosa*, and of which there are seven species. 1. Rocket, with a prickly, branching, spreading stalk; or the sweetest pale mountain Rocket. 2. Rocket, with a single, erect stalk, oval, spear-shaped, indented leaves, and the tips of the petals indented; or the garden Rocket. 3. Rocket, with a single stalk, spear-shaped, indented, trifoliate leaves, and obtuse, intire petals. 4. Rocket, with very branching, diffuse stalks, spear-shaped, rough, sawed leaves, and pods close to the stalks. 5. Rocket, with a diffuse, branching stalk, and taper pods. 6. Rocket, with wing-pointed, indented leaves, and a smooth stalk. 7. Rocket, with an erect, branching stalk, and hairy, sawed, heart-shaped leaves embracing the stalk.

The first species grows naturally in Hungary, and is much cultivated in the gardens abroad, for the fragrance of its flowers, though it is rarely seen in the English gardens.

The second sort is a native of Italy, and was formerly in much greater esteem in England than it is at present; but there is a variety of it with double flowers, greatly esteemed for its beauty, and much cultivated in our gardens.

The third and fifth species are natives of Europe.

The fourth species is a native of Africa, and only cultivated in botanic gardens for the sake of variety.

The sixth species is a native of Sicily, and the seventh of France.

Culture of the ROCKET.

The first, second, third, fifth, and seventh species, are propagated by seeds, which, if permitted to scatter, the plants will come up in the spring; but if the seeds are sown, the best time for it is autumn, for if the season proves dry, those sown in the spring often fail, or remain a long time in the ground before they vegetate. These plants require a loamy undunged soil.

If the seeds of the fourth and sixth species are permitted to scatter, the plants will come up without any other trouble than that of being kept clear from weeds.

ROELLA, a genus of plants ranged by Linnæus among the *pentandria monogynia*, and of which there is only one species.

This is a shrubby plant, and a native of Africa. The root is whitish, large, and divided, and it sends to a great distance a number of thick fibres. The stem rises to no great height, it is woody, and covered with a brown bark; it divides almost from the ground into innumerable branches, and forms a wild bush of very pleasing aspect. The leaves are small, and have no footstalks; they are oblong, narrow, sharp-pointed, and of a very firm substance. Their colour is a lively green, and on each side they are edged with rows of fine hairs, resembling weak thorns. The flowers terminate the branches; they are large and very beautiful; each is formed of a vast single petal, irregularly divided into four, five, or six great segments at the edge. The colour of these segments is a deep and glowing purple, and in the centre the flower becomes almost white.

Culture of the ROELLA.

It is propagated by seeds, which never succeed so well as when brought from its natural place of growth. They

must be sown upon a hot-bed early in the spring, and raised with the usual care, transplanting them from one bed to another as they gather strength, and after three removals, into pots, filled with the following compost, which must be prepared some months before it is wanted: Mix four bushels of rich earth, from a pasture, with one bushel of pond-mud, five pecks of old dung from a melon-bed, and two pecks of sand.

The pots must be of a middling size, and when the plants are set, one in each pot, give them a gentle watering, and place the pots in a bark-bed, that has not too much heat: after they have been shaded, and carefully watered in this bed, for some days, let the air be admitted by degrees, that they may be hardened to bear the open situation of the green-house plants in summer; among which they must be placed in the warmest months, and at the approach of autumn taken into the green-house.

RONDELETIA, a genus of plants, of which there are only two species. 1. Rondeletia with leaves growing upon footstalks. 2. Rondeletia with leaves sitting close to the branches.

The first species is a native of Malabar. It rises with a woody stem six feet high. The branches are covered with a smooth bark. The leaves are oval, stiff, and of a lucid green. The flowers terminate the branches in large bunches: they are of a yellowish white colour, and have a fragrant odour.

The second species is a native of Jamaica and the Spanish West Indies. It rises to the height of ten feet. The leaves are oblong, and end in acute points; their colour is a lucid green on the upper side, but the under is paler. The flowers, which are white, grow in bunches at the ends of the branches; they have very little scent.

Culture of the RONDELETIA.

Both species are propagated by seeds, which should be sown on a hot-bed early in the spring; when the plants are come up and fit to remove, they must be transplanted into separate small pots, and plunged into a moderate hot-bed of tanners-bark, where they must be treated like other tender plants from the same country.

ROOT, that part of a plant which imbibes the nutritious juices of the earth, and transmits them to the other parts; or the part of a plant by which it draws its nourishment, and which also produces the herb with the fructification.

The roots of plants are distinguished according to their different forms: thus, a *bulbous* root is one of a round, or roundish figure, usually furnished with fibres at its base. The terms used in describing bulbous roots are,

1. *Solid*, which expresses the whole root to be one uniform lump of matter.

2. *Tunicated*, expressing such bulbs as are formed of multitudes of coats, surrounding one another.

3. *Squammose*, expresses such as are composed of, or covered with lesser flakes.

4. *Duplicate*, such roots as are composed of two, and,

5. *Aggregate*, such as are composed of several smaller roots.

Tuberos expresses a root large and fleshy, thicker than the stalk of the plant, of an irregular figure, and wanting the characters of the bulbous. When the tuberos roots adhere immediately to the base of the stalk, they are called *sessile*; and when they are fixed to the ends of the fibres, *pendulous*.

Fibrous expresses a root, consisting of one or more slender bodies, oblong, and less thick than the stalk of the plant. When a fibrous root penetrates straight into the ground, it is called *perpendicular*; when it creeps under the surface, *horizontal*; when somewhat thick, it is called *fleshy*; when very thin, *capillary*; when it runs all the way undivided, *simple*; when divided, or when it sends off smaller roots, *branched*; when its surface is covered with extremely short and fine fibres, *hairy*.

Hollow ROOT. See the article MOSCHATEL.

ROSE TREE, *Rosa*, a genus of plants ranged by Linnæus among the *icosandria polyginia*, and of which he distinguishes only twelve species, but other authors have

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enumerated a great number more, all of which have several varieties.

Culture of the ROSE-TREE.

All the sorts of Roses may be propagated either by suckers, by layers, or by budding them upon stocks of other sorts of Roses; the last method is only necessary for the finer sorts, which do not naturally shoot vigorously, and with very few suckers. The best sort of Roses for stocks is the Frankfort kind; the season for doing it is in June, and there must be great care taken afterwards, that the stalk produce no suckers at the bottom, for these would soon starve the bud.

When roses are to be propagated from suckers, they are to be taken off annually, and planted into nursery beds, or into the places where they are to stand. They always take root the first year, but if suffered to remain on the stock longer, they grow woody, and often fail.

But the best method of obtaining vigorous plants, is by laying down the shoots; this must be done in autumn, and by the autumn following they will have taken root so well, that they may be cut off from the old plant, and removed to the places where they are to remain. These may be transplanted any time from October to April, but the earlier the better.

Roses in general delight in a rich, moist soil, and an open situation, in which they will produce a great number of flowers, and those much more beautiful than when they are on a dry soil, and in a shady situation.

All the pruning they require is, to have their dead wood cut, and their suckers taken away every autumn; and if there are any very luxuriant branches, they may be shortened, and the doing this will supply the other parts of the tree with fresh wood.

ROSE of *Jericho*, *Anastatica*, a genus of plants ranged by Linnæus among the *tetradynamia filiculosa*, and of which there is only one species.

This is an annual plant, which grows naturally about the shores of the Red Sea, and in many parts of Syria. The flowers have no beauty; but when the seeds are ripe, the branches will draw up and contract, so that the whole plant forms a kind of ball, or globular body, which will expand again, on being laid a little time in warm water; the singularity of this property, induces many persons to preserve these plants in their repositories of curiosities.

Culture of the ROSE of Jericho.

It is propagated by seeds, which should be sown the beginning of April, on a border of light sandy earth. When the plants are come up, they should be thinned so as to stand at the distance of eight inches one from another; after which they only require to be kept clear from weeds. They flower in August, but seldom ripen their seeds in England.

ROSE-BAY. See the article OLEANDER.

China ROSE, a species of Hibiscus. See the article HIBISCUS.

Dwarf ROSE-BAY, *Rhododendron*, a genus of plants ranged by Linnæus among the *decandria monogynia*, and of which there are many species; but three of them only are cultivated in England, viz. 1. Rose-bay with naked hairy leaves and funnel-shaped petals. 2. Rose-bay with smooth leaves, which are hoary on their under side. 3. Rose-bay with oval leaves, sharply reflexed on their borders.

The first species is a low shrub, seldom exceeding two feet in height; it sends out a great number of short ligneous branches. The leaves are oval, entire, and have a great number of fine iron-coloured hairs on their under sides. The flowers terminate the branches in bunches; they are of a pale red colour, and composed of one funnel-shaped petal; the tube is about half an inch long, and the brim is cut into five obtuse segments, which spread half open.

The second species, like the former, grows naturally on the Alps, and several mountains in Italy. It is a shrub about three feet high, having many irregular branches. The leaves are smooth, spear-shaped, and entire, the upper side is of a lucid green, and the under

of an iron colour. The flowers terminate the branches, they are funnel-shaped, and have short tubes cut into five acute segments at the brim, which spread a little open; they are of a beautiful pale Rose colour.

The third species is a native of North America; where there usually rise several stems from one root, which grow ten or twelve feet high. The leaves are large, of a thick consistence, and continue green all the year. The flowers are of a delicate pale Rose colour, spotted with a deeper red.

Culture of the Dwarf ROSE-BAY.

These plants are propagated by seeds, which should be sown as soon as they are ripe, in pots filled with fresh loamy earth, and covered very lightly with a little fine earth, then plunge the pots up to the rims in a shady border, and in hard frost they must be covered with bell or hand-glasses, which should be taken off in mild weather. When the plants come up, they must be kept shaded from the sun, and often refreshed with water. The autumn following they may be transplanted to a shady situation, on a loamy soil, covering the ground about their roots with moss, which will preserve them from frost in the winter, and keep the ground moist in summer.

Guelder ROSE. See the article GUELDER-ROSE.

Virginia Guelder ROSE, a species of Spiræa. See the article SPIRÆA.

Rock ROSE, *Cistus*, a genus of plants ranged by Linnæus among the *polyandria monogynia*, and of which there are several species, most of them shrubby plants, and natives of Italy, France, Spain, Portugal, or England.

They are great ornaments to a garden; their flowers are produced in plenty all over the shrub, which though but of short duration, yet are succeeded by fresh ones almost every day for above two months.

For a beautiful variety of the Rock-Rose, see the article Spotted CISTUS.

Culture of the Rock ROSE.

The several sorts of this beautiful shrub are propagated by seeds, which must be sown in March on a gentle hot-bed, or on a warm border of common rich earth. When the plants are about three inches high, they should be transplanted either into small pots, or into a border of rich earth, allowing the space of ten inches between each plant. The first winter they must be protected from hard frosts, and sometimes gently watered.

The spring following, they must be very carefully removed, with as much as possible of their own earth about them, and placed where they are to remain. These plants seldom succeed if removed when old.

They may also be propagated by cuttings, which must be planted in a rich bed, and shaded with mats, observing to water them carefully for two months; by which time they will have taken root, and may then be treated as the seedling plants of the same age.

ROSEMARY, *Rosmarinus*, a genus of plants ranged by Linnæus among the *diandria monogynia*, and of which there is only one species; but we have three or four different varieties of this shrub in our gardens; which grow wild in the south of France, in Spain, and in Italy, on the rocks near the sea, where they multiply prodigiously. With us they grow the most vigorously on a moist, rich soil, but they are much sweeter scented when on poor ground, and on such they bear the severity of our winters much better, than where they grow more freely.

Culture of the ROSEMARY.

All these plants are propagated by planting slips or cuttings of them, in the spring of the year, on a bed of light fresh earth, and when they are rooted, they must be removed into the places where they are to remain. The best season for doing this is in August, for if they are planted later, they seldom live through the winter; therefore such as are not transplanted at this time should be left till the following spring, when March is a very good time for removing them; and if this is done in showery weather, they take root almost immediately.

The plants are sometimes killed in cold winters, but when by accident they have rooted themselves in an old

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wall, as is often the case, they stand all weathers unhurt, which is owing to their being stunted and their roots dry.

ROYENA, a genus of plants, which has no English name, and of which there are three species. 1. Royena with oval, rough leaves. 2. Royena with smooth, spear-shaped leaves. 3. Royena with hairy spear-shaped leaves.

These plants are natives of the Cape of Good Hope.

The first species rises to the height of ten feet. The leaves are oval, shining, and continue green all the year. The flowers have no beauty.

The second species rises with a shrubby stalk six feet high. The leaves are oval, extremely small, smooth, entire, of a lucid green, which continues all the year. The flowers are white, and succeeded by a purple fruit, which ripens in winter.

The third species rises with a strong woody stem, seven feet high. The leaves are spear-shaped, hoary, and covered with soft hairs. The flowers are very small, and their colour a dingy purple.

Culture of the ROYENA.

These plants are all propagated by cuttings, which in September must be planted in small pots, and plunged into a very moderate hot-bed, where they must be covered with hand-glasses, and refreshed with a little water once in ten days. When the cuttings shoot, they must be gradually inured to bear the open air.

If the plants put out any young shoots from the bottom, they should be carefully laid down in the ground while young, sitting them in the same manner as is practised for carnations. They must be frequently, but gently watered, during the warm weather, but in winter very little should be given them. When these are rooted, they may be taken off, and treated in the same way as the cuttings.

These plants must always be removed into the greenhouse in autumn, and treated in the same manner as the orange-trees.

RUE, *Ruta*, a genus of plants ranged by Linnæus among the *decandria monogynia*, and of which there are three species. 1. Rue with decompounded leaves, or the broad-leaved garden Rue. 2. Rue with trifoliate sessile leaves. 3. Rue with single undivided leaves.

Culture of the RUE.

All these species are propagated either by sowing their seeds or by planting slips or cuttings, both which must be done in the spring, on a bed of light earth; and when the young plants are about two inches high, they should be removed to the places where they are designed to remain.

Goat's RUE, a genus of plants ranged by Linnæus among the *diadelphia decandria*, and of which he distinguishes only one species.

This plant has a perennial root, and grows naturally upon the borders of cultivated fields in Italy, Spain, and Africa.

Culture of the Goat's RUE.

It is propagated by seeds, which may be sown either in the spring or autumn, in an open situation. The plants, when they come up must be kept clear of weeds, till they are strong enough to be removed; then a spot of ground, proportionable to the quantity of plants should be well dug, and cleared from the roots of all noxious weeds; after which the plants being taken carefully up, should be planted one foot asunder, in rows at the distance of one foot and a half, observing to water them till they have taken new root; after which they will only require the common care of being kept clear from weeds.

Meadow RUE, *Thalictrum*, a genus of plants ranged by Linnæus among the *polyandria polyginia*, and of which there are eleven species. 1. Meadow Rue with a furrowed leafy stalk, and many erect panicles of flowers. 2. Meadow Rue with an angular stalk, narrow leaves ending in two or three points, and many erect panicles of flowers. 3. Meadow Rue with a pendulous triangular fruit, and a taper stalk. 4. Meadow Rue with a furrowed leafy stalk, and linear, fleshy leaves. 5. Meadow Rue with flowers having five petals, and a fibrous root. 6. Meadow Rue with flowers having five petals,

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and a tuberous root. 7. Meadow Rue with leaves cut into six segments, and pendulous flowers. 8. Meadow Rue with a very branching, paniculated, leafy stalk. 9. Meadow Rue with male and female flowers upon different plants. 10. Meadow Rue with spear-shaped, linear leaves, which are entire. 11. Meadow Rue with a single stalk, which is almost naked, and terminated by a single bunch of flowers.

The first and seventh species are natives of England. The second, fourth, and eighth of France. The third and eleventh sorts grow naturally on the Alps. The fifth and ninth in North America. The sixth in Spain; and the tenth in Italy and some parts of Germany.

Culture of the Meadow RUE.

The third, fifth, and sixth species are the only ones worth cultivating in gardens. They are propagated by parting their roots in autumn, when their leaves begin to decay: they should have a fresh, light soil, and a shady situation, where the plants will come up without any trouble.

Wild Syrian RUE, *Peganum*, a genus of plants ranged by Linnæus among the *dodecandria monogynia*, and of which there are only two species. 1. Wild Syrian Rue, with many pointed leaves. 2. Wild Syrian Rue, with undivided leaves.

The first species is a native of Syria, and the second of Siberia.

Culture of the Wild Syrian RUE.

These plants are propagated by seeds, which should be sown in April upon a bed of light earth. When the stalks are decayed the beds should be covered with tanners-bark, ashes, or saw-dust, to preserve the young roots from frost. In March following they may be taken up and transplanted into a warm situation and a dry soil, where they will continue several years.

RUELLIA, a genus of plants which has no English name; there are four species of it. 1. Ruellia, with oval, crenated leaves, and foot-stalks bearing two flowers. 2. Ruellia, with leaves having foot-stalks, and flowers growing in whorls sitting close to the stalks. 3. Ruellia, with leaves having foot-stalks, and long naked foot-stalks to the flowers. 4. Ruellia, with oval, spear-shaped leaves, which are somewhat crenated, oval pods, and prickly, hairy, small leaves.

The first and third species are natives of the West-Indies. The second sort grows naturally in Carolina; and the fourth in both Indies.

Culture of the RUELLIA.

These plants are all propagated by seeds, which in spring must be sown in pots, and plunged into a moderate hot-bed. When the plants come up they must be transplanted each into a separate small pot, and placed in a fresh hot-bed of tanners-bark, where they must be shaded from the sun till they have taken new root, after which they should have free air admitted to them every day when the weather is warm. In July they will flower, and perfect their seeds in August.

RUSCUS, a genus of plants of which there are eight species. 1. Ruscus, with leaves which bear flowers on their upper side and are naked; commonly called Knee-holly or Butchers-broom. 2. Ruscus, with leaves which bear flowers beneath and are naked. 3. Ruscus, with flowers under the leaves. 4. Ruscus, with hermaphrodite flowers; or *Laurus Alexandrina*. 5. Ruscus, with oval, acute-pointed leaves, which are placed by threes, and flowers on their upper side. 6. Ruscus, with acute-pointed leaves, bearing flowers on their upper side and flexible stalks. 7. Ruscus, with flowers growing on the borders of the leaves. 8. Ruscus, with a shrubby branching stalk, spear-shaped, stiff leaves, and flowers growing upon foot-stalks.

The first species grows wild in most parts of England, and is never admitted into gardens.

The other species are all natives of different parts of Europe.

Culture of the RUSCUS.

The second, third, fourth, fifth, and sixth species are propagated by parting of their roots in autumn, but they should not be divided into very small parts, which will prevent their growth for two or three years.

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These plants are very proper for planting round the verges of woods, or under large trees in wilderness quarters.

The seventh and eighth species are also propagated by parting of the roots, but they must be set in pots, that they may be removed into the green-house in winter, where they must always have free air in mild weather, and in summer be placed abroad with other hardy green-house plants.

Sweet RUSH. See the article ACORUS.

RUYSCHIANA, a genus of plants of which there are three species. 1. Ruyschiana, with spiked flowers, linear leaves, and bractæ which are smooth and undivided. 2. Ruyschiana, with spiked flowers, and hairy, linear, three-pointed leaves.

The first species grows naturally in Austria and Hungary. The second in Siberia; and the third in Tartary.

Culture of the RUYSCHIANA.

These plants are propagated by seeds, which must be sown the latter end of March, on a bed of light earth in an open exposure; when the plants come up they must be carefully weeded, and when they are about two inches high they should be transplanted into a bed or border of light undunged earth, where they must be shaded from the sun till they have taken root, after which they must be kept clean from weeds till Michaelmas, when they should be carefully taken up with balls of earth to their roots, and planted among other hardy plants in the flower-garden, where they will make an agreeable variety.



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SAFFRON, *Crocus*. See the article CROCUS.

Bastard SAFFRON, or **SAFFLOWER**, *Carthamus*, a genus of plants ranged by Linnæus among the *syngenesia polygamia equalis*, and of which there are six species. 1. Bastard Saffron, with oval, entire, sawed, spiny leaves. 2. Bastard Saffron, with a hairy stalk, woolly above, the under leaves pinnatifid, and the upper ones embracing the stalks. 3. Bastard Saffron, with spear-shaped leaves sharply sawed. 4. Bastard Saffron, with unarmed leaves, the lower ones indented, and those on the stalks winged. 5. Bastard Saffron, with narrow-winged leaves on the stalks, of the length of the plant. 6. Bastard Saffron, with sword-shaped, sinuated and indented leaves.

The first species is a native of Egypt. The second, third, and fourth sorts grow naturally in France, Italy, and Crete. The fifth in France; and the sixth in Spain.

Culture of the Bastard SAFFRON.

The first and second species are propagated by seeds: those of the first sort must be sown in April, and those of the second in autumn, upon a bed of light earth; they should be scattered thinly in drills drawn at a foot and a half distance from each other. In a fortnight or three week after the plants appear, the ground should be hoed to destroy the weeds, and the plants thinned where they grow too close: soon after they must be hoed again, and the plants thinned to the distance of a foot from each other; after this they should have a third hoeing, which if carefully performed in dry weather, the plants will require no further care till they come to flower.

When this plant is cultivated for the sake of the florets, which are used in dying and painting, they should be cut off from the flowers as they come to per-

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fection: but this must be performed when they are perfectly dry, and then they should be dried in a kiln, as the true saffron for use. But if the plants are cultivated for the seeds, which were formerly used in medicine, the flowers must not be gathered, but the seeds seldom come to perfection in this country.

The third and fourth species are propagated by parting the roots, which should be done about the beginning of March; they require a dry soil and a warm situation.

The fifth species is very difficult to propagate in England, for the roots do not put out off-sets, so that it can only be raised from seeds, which, unless the season proves hot, never succeed here.

The sixth species is propagated by side-shoots taken from the branches in spring, which must be planted in pots filled with light sandy earth, and plunged into a moderate hot-bed, observing to shade them till they have taken root; after which they must be gradually hardened, and removed into the open air. When they have obtained strength they should be separated, and some of them planted in a warm, dry border, where they will endure the cold of our ordinary winters.

Meadow SAFFRON, *Colchicum*, a genus of plants ranged by Linnæus among the *hexandria trigynia*, and of which there are three species. 1. Meadow Saffron, with plain, erect, spear-shaped leaves; or the common meadow Saffron. 2. Meadow Saffron, with very narrow spreading leaves. 3. Meadow Saffron, with waved, spreading leaves.

There are several varieties of this flower, all of which are supposed to have been obtained from the seeds of the first species.

The method of cultivating these plants is exactly the same as that of tulips: to which article we refer the reader.

SAGE, *Salvia*, a genus of plants ranged by Linnæus among the *diandria monogynia*, and of which there are twelve species. 1. Sage, with spear-shaped, oval, entire leaves. 2. Sage, with heart-shaped, lower leaves, the upper of which are oblong, oval, sawed, and woolly. 3. Sage, with spear-shaped leaves; commonly called Sage of Virtue. 4. Sage, with linear, spear-shaped, woolly, entire leaves. 5. Sage, with the lower leaves winged, the upper ones trifoliate and rough. 6. Sage, with spear-shaped, oval, entire leaves, which are slightly crenated. 7. Sage, with compound, winged leaves. 8. Sage, with winged lower leaves, the upper ones single and crenated. 9. Sage, with heart-shaped, blunt, crenated leaves, which are somewhat woolly. 10. Sage, with roundish, entire leaves, which are indented at their base. 11. Sage, with roundish, sawed leaves, indented at their base. 12. Sage, with oblong, oval, entire leaves.

The first, second, and third species are natives of the southern parts of Europe: there are the following varieties of the first.

1. The common green Sage.
2. The green Sage with a variegated leaf.
3. The red Sage.
4. The red Sage with a variegated leaf.
5. The wormwood Sage.

The fourth species is a native of Spain. The fifth and eighth sorts grow naturally about Smyrna. The sixth in Crete. The seventh in the Levant. The ninth at Mexico; and the tenth, eleventh, and twelfth species are natives of the Cape of Good Hope.

Culture of the SAGE.

The first, second, third, and fourth species are easily propagated by slips, which should be planted the beginning of April on a shady border, and, if the season proves dry, they must be frequently refreshed with water. When they have made good roots they should be taken up with balls of earth to them, and set where they are to remain, which should always be upon a dry soil, and where they may have the benefit of the sun.

The slips of the fifth, sixth, and eighth species should be planted in pots; which in winter must be placed under a hot-bed frame, and a great share of fresh air admitted to them when the weather is mild. In summer they

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they must be placed abroad in a sheltered situation, and often refreshed with water.

These plants must be potted once, if not twice, every summer, for their roots increase very fast, and if confined, they will turn mouldy and decay.

The seventh and ninth species are propagated by seeds, which should be sown upon a bed of light earth in the places where they are to remain: those of the seventh sort should be sown in autumn, and those of the ninth the beginning of April. When the plants come up they only require to be thinned where they grow too close, and kept clean from weeds. The plants of the ninth species will grow tall, so must be supported to prevent their being broke by the wind.

The tenth, eleventh, and twelfth species are propagated by seeds, which should, if possible, be procured from the Cape of Good Hope: but if there is no opportunity for this, they may be had from France or Holland. These should be sown in spring upon a moderate hot-bed; and at the same time the following compost must be prepared:

Take two barrows of pond-mud, one barrow of mellow cow-dung, and half a barrow of common earth from under the turf in a dry pasture: mix these well together, sprinkle the whole with a little brine, and let it lie in a heap to mellow.

When the plants are come up water them at times very gently, and when they have got some strength remove them into a second, and afterwards into a third hot-bed. When the summer is advanced fill some large pots with the above compost, and set one plant in each, and when they are all planted give them a gentle watering: set the pots under a warm wall, and draw a mat over them at a height above the plants; keep them shaded, and water them frequently till they are well-rooted, and then set them in a warm and well-sheltered part of the garden, among other exotics that bear exposure: they must be frequently watered, and at the approach of winter removed into the green-house, where they must not be shut up too close. The next summer they must be set out with the other exotics, and treated in all respects like them.

SAGE-TREE, or *Jerusalem SAGE*, *Phlomis*, a genus of plants ranged by Linnæus among the *didynamia gymnospermia*, and of which there are twelve species.

1. Sage-tree, with roundish, woolly, crenated leaves.
2. Sage-tree, with spear-shaped involucre, and oval leaves, hairy on the under side.
3. Sage-tree, with the lower leaves heart-shaped, woolly, and hairy on every side.
4. Sage-tree, with spear-shaped, woolly leaves, those under the flowers oval and bristly, woolly involucre.
5. Sage-tree, with leaves alternately winged, the lobes of which are jagged, and with woolly cups.
6. Sage-tree, with oval leaves, woolly on the under side, and with the involucre divided into three parts.
7. Sage-tree, with bristly, prickly involucre, oblong, oval, rough leaves, and an herbaceous stalk.
8. Sage-tree, with awl-shaped, prickly involucre, rough, heart-shaped leaves, and an herbaceous stalk.
9. Sage-tree, with somewhat sawed leaves, flowers in heads terminating the branches, and cups cut into eight segments.
10. Sage-tree, with narrow involucre, cups with a single, oblique lip, and spear-shaped, ovated, hairy leaves.
11. Sage-tree, with ovated leaves, and ten angled cups, cut into seven unequal segments.
12. Sage-tree, with spear-shaped, sawed leaves, naked, narrow involucre, and ten angled cups cut into ten segments.

The first species is a native of Sicily and Spain. The second of Portugal. The third of the East-Indies. The fourth sort grows naturally in the southern parts of Europe. The fifth and sixth in the Levant. The seventh in Persia and Tartary. The eighth in Siberia. The ninth and tenth in India. The eleventh in Surinam; and the twelfth at the Cape of Good Hope.

Culture of the SAGE-TREE.

The first, second, third, fourth, ninth, tenth, eleventh, and twelfth species are shrubby plants, and propagated by cuttings, which should be planted in April,

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in a bed of light earth, where they must be shaded with mats in the day, and have gentle waterings when the ground is dry. In about a month or ten weeks they will have taken good root, when they should be carefully taken up and transplanted into a nursery, where they may remain one year, and then be removed to the places where they are designed to stand, which should be in a dry soil and a warm situation.

The fifth and sixth species are propagated by off-sets from the roots, which should be planted in warm borders: and when the plants come up they may be treated like the other sorts.

The seventh species is propagated by parting of the roots in autumn, when the stalks begin to decay, that they may get root again before the frost comes on, but they should not be parted oftener than every third year. This sort is very hardy, so may be planted in any situation, except where the soil is moist.

The eighth species is propagated by seeds, which should be sown upon an east border in the spring. When the plants come up let them be kept clear from weeds, and in autumn transplanted to the places in which they are designed to remain. They are very hardy, and will grow in almost any soil or situation.

Wild SAGE, a species of Tree Germander. See the article *Tree GERMANDER*.

Corn SALLAD, a species of Valerian. See *VALERIAN*.

SALLOW, or *WILLOW*. See the article *WILLOW*.

SALSAFY, a species of Goat's Beard. See the article *Goat's BEARD*.

SAMYDA, a genus of plants which has no English name; and there are only two species of it. 1. *Samyda*, with oval, sawed leaves. 2. *Samyda*, with compound, winged leaves.

These plants are natives of the West-Indies, where they rise with a shrubby stalk six feet high. The leaves of the first species are oval, sawed on their edges, and of a light green. The flowers grow from the wings of the leaves upon short foot-stalks, and their colour is a beautiful red.

The leaves of the second species resemble those of the walnut tree, only smaller, and the flower is of a purple colour.

Culture of the SAMYDA.

These plants are propagated by seeds, which must be procured from the country where they naturally grow, and sown in the spring upon a hot-bed. When the plants are come up they should be transplanted each into a separate pot, and plunged into a hot-bed of tanners-bark, where they must be treated in the manner already directed for other tender plants from the same country, observing to keep them always in the bark-bed of the stove.

SANICLE, *Tiarella*, a genus of plants ranged by Linnæus among the *decandria digynia*, and of which there are only two species. 1. *Sanicle*, with heart-shaped leaves. 2. *Sanicle*, with trifoliate leaves.

The first species is a native of the north parts of Asia and America; and the second grows naturally in the north of Asia.

Culture of the SANICLE.

These plants are propagated by parting of the roots, which should be done in autumn. They must have a moist soil and a shady situation, and only require to be kept clear from weeds.

Bear's-ear SANICLE. See the article *CORTUSA*.

SAP, a juice furnished by the earth, and changed into the plant, consisting of fossil, saline, aerial, and other particles from putrified animals, vegetables, &c.

The notion of the Sap's circulation was entertained by several authors much about the same time, without any communication from one another; particularly M. Major, a physician of Hamburgh, M. Perrault, Mariotte, and Maggighi. It has met, however, with some considerable opposers, particularly the excellent M. Dodart, who could never be reconciled to it.

One of the great arguments for it is, that the same experiments of ligature and incision, which evince a circulation

culuation of the blood in animals, succeed in the like manner in plants, particularly in such as abound with a milky sap, as the great tithymale, milk-thistle, &c. if the ligature be fastened tight round them, the part above is found to swell very considerably, and that below it, a little : whence it appears, that there is a juice ascending from the branches ; and that the latter is thicker than the former, which quadrates exactly with the common system ; the juice being supposed to rise in capillary vessels, in form of a subtile vapour, which, condensed in the extremes of the plant, by the neighbourhood of the cold air, turns back in form of a liquor, through the more patent pipes of the inner bark.

M. Dodart, instead of the same juices going and returning, contends for two several juices ; the one imbibed from the soil digested in the root, and from thence transmitted to the extremes of the branches, for the nourishing of the plant ; the other received from the moisture of the air entering in at the extremities of the branches : so that the ascending and descending juices are not the same.

One of his chief arguments is, that if two trees of the same kind be transplanted in one day, after first cutting off their roots and branches, and if, after they have taken root again, some of the new shoots put forth each year be cut off one of them, it will not thrive half so well, notwithstanding its root and trunk being intire as the other.

This he conceives to be a proof of the plants deriving nourishment by the branches, and concludes it to be of an aerial nature, because formed of the moisture of the air, dew, &c. whereas that imbibed from soil is terrestrial, &c. *Hist. de l'Acad. Roy. Ann. 1709.*

The humour or Sap of a plant, then, is a juice furnished by the earth, and changed into the plant, consisting of some fossil parts, other parts derived from the air and rain, and others from putrified animals, plants, &c. Consequently, in vegetables, are contained all kinds of salts, oil, water, earth, &c. and, probably, all kinds of metals too, inasmuch as the ashes of vegetables always yield somewhat which the loadstone attracts.

This juice enters the plant in form of a fine and subtile water ; which the nearer it is to the root, the more it retains of its proper nature ; and, the farther from the root, the more action it has sustained, and the nearer it approaches to the nature of the vegetable.

Consequently, when the juice enters the root, the bark whereof is furnished with excretory vessels, fitted to discharge the excrementitious part, it is earthy, watery, poor, acid, and scarce oleaginous at all.

In the trunk and branches it is further prepared, though it still continues acid ; as we see by tapping or perforating of a tree in the month of February, when it distills a watery juice apparently acid.

The juice being here carried to the germs or buds is more concocted ; and here, having unfolded the leaves, these come to serve as lungs for the circulation and further preparation of the juice.

For these tender leaves, being exposed to the alternate action of heat and cold, moist nights, and hot scorching days, are alternately expanded and contracted, and the more on account of their reticular texture.

By such means is the juice still further altered and digested, as it is further in the petala or leaves of the flowers which transmit the juice, now brought to a further subtility, to the stamina : these communicate it to the farina or dust in the apices, which is, as it were, the male seed of the plant, where having undergone a further maturation, it is shed into the pistil, which performs the office of an uterus or womb ; and thus, having acquired its last perfection, it gives rise to a new fruit or plant.

The root or part whereby vegetables are connected to their matrix, and by which they receive their nutritious juice, consists of an infinite number of vasa absorbentia, which, being dispersed through the interstices of the earth, attract or imbibe the juices of the same : consequently, every thing in the earth that is dissoluble in water, is liable to be imbibed ; as air, salt, oil, fumes

of minerals, metals, &c. and of these do plants really consist.

These juices are drawn from the earth very crude ; but by the structure and fabric of the plant, and the various vessels they are strained through, become changed, further elaborated, secreted, and assimilated to the substance of the plant.

The motion of the nutritious juices of vegetables is produced, much like that of the blood in animals, by the action of the air ; in effect, there is something equivalent to respiration throughout the whole plant.

The discovery of this is owing to the admirable Malpighi, who first observed, that vegetables consist of two series or orders of vessels.

First, such as receive and convey the alimential juices, answering to the lacteals, veins, &c. of animals.

Secondly, tracheæ or air vessels, which are long, hollow pipes, wherein air is continually received and expelled, i. e. inspired and expired ; within which tracheæ he shews all the former series of vessels are contained.

Hence, it follows, that the heat of a year, nay, of a day, of a single hour, or minute, must have an effect on the air included in these tracheæ, i. e. must rarefy it, and consequently dilate the tracheæ ; whence arises a perpetual spring or source of action, to promote the circulation in plants.

For, by the expansion of the tracheæ, the vessels containing the juices are pressed, and by that means the juice contained is continually propelled, and so accelerated ; by which propulsion, the juice is continually comminuted, and rendered more and more subtile, and so enabled to enter vessels still finer and finer, the thickest part of it being at the same time secreted, and deposited into the lateral cells or loculi of the bark, to defend the plant from cold, and other external injuries.

The juice having thus gone its stage, from the root to the remote branches, and even the flower ; and having in every part of its progress deposited something both for aliment and defence ; what is redundant passes out into the bark, the vessels whereof are inoculated with those wherein the sap mounted ; and through these it re-descends to the root, and thence to the earth again : and thus a circulation is effected.

Thus is every vegetable acted on by heat and cold, during the day-time especially, while the sun's force is considerable, the sap-vessels squeezed and pressed, and the sap protruded and raised, and at length evacuated, and the vessels exhausted ; and, in the night again, the same tracheæ being contracted by the cold of the air, the other vessels are eased and relaxed, and so disposed to receive fresh food for the next day's digestion and excretion.

What course the juice takes, after it is imbibed by the roots, is not very clear ; the vessels that take it up, to convey it to the plant, are too fine to be traced ; and hence it has been controverted, whether it is by the bark, or the pith, or the woody part, that the plant is fed.

The more common opinion is for the bark : the juice, raised by the capillaries of the wood, is here supposed to descend by the larger fibres, placed in the inmost part thereof, immediately over the wood ; in which descent, the sap, now sufficiently prepared, adds a part of its substance to the contiguous wood, and thus increases by apposition : and hence it may be, that hollow, carious, or rotten trees, which have neither pith nor wood, except just enough to sustain the bark, do grow and bear. Some contend for the wood, which they observe to consist of slender capillary tubes running parallel to each other from the root up to the trunk, being proper to receive in a fine vapour ; in the ascent whereof the fibres become opened, and their substance increased ; and thus the trunks of trees are said to increase in their circumference.

As for the pith ; as the woody substance of the trunk becomes more woody, the pith is compressed and streightened to such a degree that in some trees it quite disappears : whence it seems, that its office in vegetation is not very important, since its use is not perpetual. By

its spongy substance, it should seem fitted to receive any superfluous moisture transuding through the pores of the woody fibres: and, if by the excess of such moisture, or the like cause, it corrupt and rot, as it frequently happens in elms, the tree does not grow the worse for it; which is a convincing proof it is of no great use.

The learned Dr. Boerhaave distributes the juices of plants into six classes.

First, the first class comprehends the crude nutritious juice, or the juices of the root and stem of plants, which are little more than the mere matter of the element, as drawn by the root from the body it adheres to, whether it be earth, water, or the like.

This juice is found in every part of the plant, and therefore may be held an universal juice; yet he considers it as the juice of the root and stem, because it is chiefly found in them.

This he takes to be a subacid watery lymph, without any specific taste or smell, as not being yet arrived to the maturity of oiliness.

To this class belong those juices which distil in great abundance from wounds or incisions made in the woody parts of plants; such, for instance, is that tart liquor issuing from the root of the walnut-tree, when cut off in the month of May.

Such also is that limpid, subacid humour, flowing out very plentifully at an incision in the birch-tree in the month of March, to the quantity of several gallons in a few days.

Such also is the juice issuing out of the vine wounded in the spring-time, which always tastes tartish, and ferments like the grapes themselves.

This juice may be esteemed as yet fossil, being generated of and in the earth; for the juice of the earth, being received into the canals of this plant, retains its nature during two or three circulations; nor does immediately commence a vegetable juice.

This class of juices therefore he accounts as the chyle of the plant, being chiefly found in the first order of vessels, viz. in the roots and the body of the plant, which answers to the stomach and intestines of animals.

Secondly, the second class of the juices is that of the leaves, which are the real lungs of plants, and accordingly make a further change of the juice, which they receive from the roots and stem by force of the air. The juice of leaves is different therefore from the first juice, as being more sulphureous, and farther elaborated; not that it derives any sulphur from the sun, but that, its watery part exhaling, it becomes more oily, and less volatile.

The juice of leaves he distinguishes into three kinds:

The first is the nutritious juice of the leaves; which is that already described, only further elaborated in the minute vesiculæ of the leaves, and consequently less watery, and more oily and saccharine.

The second is wax, which, exuding out of the leaves, adheres to the surface, and is scraped off by bees with their rough thighs, to build their combs withal. This is chiefly afforded by lavender and rosemary: upon the latter of which, the wax may be plainly perceived sticking to the leaves of it.

The third is manna: not that with which the Israelites were fed in the desert, but a drug sold among us: it is an essential saccharine salt, exuding chiefly by night, and, in the summer-season, from the leaves of a sort of ash growing in Calabria and Sicily, and adhering thereto in the form of a crust, to be gathered the next morning before the sun is up.

The like substance is found to exude from the leaves of the linden-tree and poplar, in the heats of May and June; at which time they have an honey-taste, and are even seen with a fatty juice on them, which, at the approach of the cold evening, gathers into grains.

Thirdly, the third class of juices are those of flowers, or the genital parts of plants; in these are:

First, a pure, elaborated, volatile oil or spirit, wherein the particular smell of the plant or flower resides, and which, by reason of its extreme volatility, exhales spon-

taneously; insomuch that, if the flower be laid for some time in a warm place, the odorous juice or spirit will be all fled.

The second is the juice expressed from the flower, which in reality is the same with that of the root and leaves, only farther prepared; it is thicker than the former, and has scarce any smell at all: thus, if you bruise an hyacinth, or other fragrant flower, and express the juice, it will be found altogether inodorous.

The third is the sweet juice called honey, which exudes from all flowers; aloes, colocynthis, and other bitter flowers, not excepted.

In all male flowers, that have utricles at the bottom of the petala, which Dr. Linnæus styles the nectarium, is found a viscid, ruddy, sweet juice in some plenty; and accordingly we see the children gather cowslips, foxgloves, honeysuckles, &c. and suck the honey from them: the bees too visit these flowers, and, putting in their proboscides or trunks, suck out the honey, and load their stomachs therewith, to be afterwards discharged and laid up in their combs: so that honey is a vegetable juice.

Fourthly, the fourth class of juices are those of the fruit and seed; the preparative whereof is nature's final work: which performed, the plants seem to die for a time, as all animals are seen to languish after the emission of their semen.

The juice of the fruit is like that of the root, only farther elaborated.

The juice of the seed is an essential oil or balm, elaborated and exalted to its last perfection. This juice or oil is not found in the very point or embryo in the center of the placenta; all we meet with in that part, is a few fine watery particles secreted from the placenta: but it is in the placenta or cotyledons themselves, which consist of innumerable little folliculi or cells, wherein this only juice is contained, serving to defend the embryo, and preserve it from being corrupted by water, which, it is well known, will hardly pass through oil.

Thus, if you take, for instance, fennel-seed, cut it through the middle, and apply it to the microscope, you will easily perceive a clear shining oil in the cells of each lobe, investing the tender embryo. Without this oil, it were impossible a seed should live a month, and much less, a year or two, intire and uncorrupted in the ground.

This oil is found in the seeds of all plants; in some, for instance, in almonds, cocoa-nuts, &c. in very great quantities; in others less, as pepper, arum, &c. where one would scarce imagine any oil at all: and these seeds lose their vegetative quality very soon.

Fifthly, the fifth class of juices are those of the bark; which is an artful congeries or bundle of perspirative ducts, and absorbent vessels.

Of these juices there are divers species; for the several humours raised and distributed through the leaves, flowers, and other parts of the plants, have all circulated through the bark, and accordingly are frequently found to distil from wounds made therein. In some cases, even the whole plant is no more than bark, the pulp having been eaten out; as in willows, poplars, &c. which will live a long time in that state.

The bark serves divers purposes; for it not only transmits the nutritious juices of the plants, but also contains divers fat oily humours, to defend the fleshy parts from the injuries of the weather.

Sixthly, as animals are furnished with a panniculus adiposus, usually replete with fat, which invests and covers all the fleshy parts, and screens them from external cold; so are plants incompassed with a bark replete with fat juices, by the means whereof the cold is kept out, and in winter-time the spiculæ of ice prevented from fixing and freezing the juices in their vessels; whence it is that some sorts of trees remain ever-green the year round, by reason their barks have more oil than can be spent and exhaled by the sun; and their leaves are covered with a thick oily film over their surface, which prevents their perspiring, so much as other plants, and also defends them from the cold, &c.

All the juices of barks are reducible to eight, viz.

First, the crude, acid, watery juice, called the chyle of the plant.

Secondly, an oily juice, which, bursting the bark in the beginning of the summer, exudes out of several plants; as cypress, pine, fir, savin, juniper, and other ever-greens; and such alone: this oil dissolves by the smallest degree of warmth, and is easily inflamed, and is that which defends the plant; which is the reason why most of these plants will not thrive in very hot climates.

For balm, or fatty liquor, more glutinous than oil, is nothing but the last-mentioned oily juice, which was more fluid during the spring-time; but which, by the greater heat of the sun, has evaporated all its most subtile parts, and is converted into a denser liquor. Thus the finer part of oil of olives being exhaled by the summer's warmth, there remains a thick balsam behind: thus also oil of turpentine, having lost its more liquid parts by heat, becomes of the thick consistence of a balm.

Thirdly, a pitchy juice, which is the body of the oil itself, inspissates, and turns black, when put in a great warmth: this is the most observed in the pine and fir.

Fourthly, resin, which is an oil so far inspissated, as to become friable in the cold, and may be procured from any oil, by boiling it much and long. Thus, if turpentine be set over a gentle fire, it first dissolves, and becomes an oil, then a balsam, then pitch, and then a resin; in which state it is friable in the cold, fusible by fire, and withal inflammable and combustible; dissoluble in spirit of wine, but not in water, which makes the character of resin.

Hence the oil is most abundant in the barks in the winter time, the balsams in summer, and the resin in autumn.

Fifthly, colophony, which is a resin still farther exhausted of its volatile part, being pellucid, friable, and approaching to the nature of glass.

Sixthly, gum, which is an humour exuding out of the bark, and, by the warmth of the sun, concocted, inspissated, and rendered tenacious, but still dissoluble in water and at the same time inflammable, and scarce capable of being pulverised. This oily mucilage serves as a pigment to cover over, and defend the buds of trees, from the injuries of wet and frost in winter; but will melt with a moist warmth, and easily run from them, when the gentle warmth of the spring approaches: nor is ever so far hardened into a crust, as to do any injury to the inclosed shoot. This oily substance always contains in it an acid spirit; which is a preservative against putrefaction.

Seventhly, a gummous resin; which is an humour secreted in the bark, and dried by the heat of the sun; and thus constituting a body that is partly gummous, and, as such, tenacious, and soluble in water; and partly resinous, and therefore friable, and soluble in oil, or spirit of wine, but not in water.

Botanists are now generally agreed, that all plants are furnished with organs and parts necessary both for chylification and sanguification; that they have veins, arteries, heart, lungs, adipose, cellules, &c. If so, it is obvious, that there must be some difference between the juices, which have not undergone the action of those parts, and such as have already circulated a number of times.

The several juices, hitherto recounted, are the first or nutritious juice, called also the chyle of the plant, under such alterations, and new modifications, as it undergoes in being received, and kept some time, in parts of a peculiar structure; as leaves, flowers, seed, &c. This last juice, called the blood, is the same nutritious juice farther altered, by being divers times passed through each of those parts, and remixed, and at length converted into a new juice, with properties different from any of them all.

To prove the circulation of the sap, instances are brought from experiments made by Mr. Fairchild; as, his budding or inoculating of a passion-tree, whose leaves are spotted with yellow, into one of that sort of passion-

tree whose leaves are plain: for though, the buds did not take, yet, after it had been budded a fortnight, the yellow spots began to shew themselves about three feet above the inoculation; and, in a little time after that, the yellow spots appeared on a shoot, which came out of the ground from another part of the plant; which has been accounted a plain proof of the sap's circulation.

Another instance is, a second experiment of the same person, who grafted the ever-green oak, or ilex, upon the common oak. The leaves of the common oak, which was the stock, decayed, and fell off, at the usual season of the year; but the ever-green oak, which was the cyon grafted upon it, held its leaves, and continued shooting in the winter. From whence it is concluded, that, when trees drop their leaves, the sap keeps full in motion, and is not gone into the root, as some persons think.

There are also other experiments of the same person, which were shewn before the Royal Society; as the New-England cedar, or rather juniper, grafted on the Virginian: and what is taken to prove the circulation in it, is, the branch which was grafted was left several inches below the grafting; which continued growing as well as the upper-part above the grafting.

And also another, which is the viburnum, with the top planted in the ground, which was become roots; and the roots turned up, which were become branches: which plant was in as good a state of growing, as it was in its natural state.

A third experiment of his was on a pear-tree, which he inarched upon two pear-stocks, in March 1721-2, having the roots out of the ground; and was in a good flourishing state, with a branch in blossom, that receives no other nourishment but by the juices that return down the other two branches; which, though it had been done above two years, yet it continued shooting suckers out of the root; which is esteemed as a proof, that the branches are as useful to support the roots, as the roots the branches: and thence he infers, that it is not strange, that so many trees miscarry in planting, when there are no branches left to the head to maintain the circulation to the roots.

A fourth experiment he made on the cedar of Lebanon, grafted on the larix, which dropped its leaves in the winter, yet maintained the cedar in a flourishing condition, as if it had been on a tree which held its leaves all the winter; and the circulation of juices supported the graft below the grafting, and kept it in as good health as above the grafting.

In opposition to the notion of the circulation of the sap in trees like to that in animal bodies, the Rev. Dr. Hales, in his excellent treatise on Vegetable Statics, presents us with various experiments; and says:

When the sap has first passed through that thick and fine strainer, the bark of the root, we then find it in greatest quantities in the most lax part, between the bark and wood, and that the same through the whole tree.

And, if, early in the spring, the oak, and several other trees, were to be examined near the top and bottom, when the sap first begins to move, so as to make the bark run, and easily peel off, he believes it would be found, that the low bark is first moistened; whereas the bark of the top branches ought first to be moistened, if the sap descends by the bark. As to the vine, he says, he is pretty well assured, that the lower bark is first moistened.

He adds, that it is to be seen in many of the examples of the experiments he has given in that book, what quantities of moisture trees daily imbibe and perspire: now the celerity of the sap must be very great, if that quantity of moisture must most of it ascend to the top of the tree, then descend, and ascend again, before it is carried off by perspiration.

The defect of a circulation in vegetables seems, in some measure, to be supplied by the much greater quantity of liquor, which the vegetable takes in, than the animal, whereby its motion is accelerated; for, by the first

first example he gives, we find the sunflower, bulk for bulk, imbibes and perspires seventeen times more fresh liquor than a man every twenty-four hours.

Besides, nature's great aim in vegetables being only, that the vegetable life be carried on and maintained, there was no occasion to give its sap the rapid motion which was necessary for the blood of animals.

In animals, it is the heart which sets the blood in motion, and makes it continually circulate: but in vegetables we can discover no other cause of the sap's motion, but the strong attraction of the capillary sap-vessels, assisted by the brisk undulation and vibration caused by the sun's warmth; whereby the sap is carried up to the top of the tallest trees, and is there perspired off through the leaves: but, when the surface of the tree is greatly diminished by the loss of its leaves, then also the perspiration and motion of the sap are proportionably diminished; as is plain from many of his experiments.

So that the ascending velocity of the sap is principally accelerated by the plentiful perspiration of the leaves, thereby making room for the fine capillary vessels to exert their vastly attracting power; which perspiration is effected by the brisk rarefying vibrations of warmth; a power that does not seem to be any-ways well adapted to make the sap descend from the tops of vegetables, by different vessels, to the root.

If the sap circulated, it must needs have been seen descending from the upper part of large gashes, 'cut in' inches let in water, and with columns of water pressing on their bottoms in long glass tubes, in his forty-third and forty-fourth experiments. In both which it is certain, that great quantities of water passed through the stem: so that it must needs have been seen descending, if the return of the sap downwards were by motion or pulsion, whereby the blood in animals is returned through the veins to the heart; and that pulsion, if there were any, must necessarily be exerted with proportionable force, to be able to drive the sap through the fine capillaries.

Secondly, as to the return of the sap downwards, it must be by attraction, and that a very powerful one, as is plain from many of these experiments, and particularly by experiment the eleventh. But it is hard to conceive what and where that power is, which can be equivalent to that provision nature has made for the ascent of the sap, in consequence of the great perspiration of the leaves.

The instances of the jasmine-tree, and of the passion-tree, have been looked upon as proofs of the circulation of the sap; because their branches which were far below the inoculated bud, were gilded. But we have many visible proofs in the vine, and other bleeding trees, of the sap's receding back, and pushing forwards alternately, at different times in the day and night; and there is great reason to think, that the sap of all other trees has such an alternate receding and progressive motion, occasioned by the alternacies of day and night, warm and cold, moist and dry.

For the sap in all vegetables does probably recede, in some measure, from the tops of branches, as the sun leaves them; because, its rarefying power then ceasing, the greatly rarefied sap and air mixed with it will condense, and take up less room than they did, and the dew and rain will then be strongly imbibed by the leaves, as is probable from the forty-second experiment, and several others; whereby the body and branches of the vegetable, which have been much exhausted by the great evaporation of the day, may, at night, imbibe sap and dew from the leaves.

For, by several experiments in the first chapter of the book of Vegetable Statics, plants were found to increase considerably in weight in dewy and moist nights.

And by other experiments on the vine, in the third chapter, it was found, that the trunk and branches of vines were always in an imbibing state, caused by the great perspiration of the leaves, except in the bleeding season; but, when at night the perspiring power ceases, then the contrary imbibing power will

prevail, and draw the sap and dew from the leaves, as well as moisture from the roots.

And we have a further proof of this in the twelfth experiment, where, by fixing mercurial gauges to the stems of several trees which do not bleed, it is found that they are always in a strongly imbibing state, by drawing up the mercury several inches; whence it is easy to conceive, how some of the particles of the gilded bud in the inoculated jasmine may be absorbed by it, and thereby communicate their gilding miasma to the sap of the other branches; especially when, some months after the inoculation, the stock of the inoculated jasmine is cut off a little above the bud, whereby the stock, which was the counter-acting part of the stem, being taken away, the stem attracts more vigorously from the bud.

Another argument for the circulation of the sap is, that some sorts of grafts will infect and canker the stocks they are grafted on; but by the twelfth and thirty-seventh experiments, where mercurial gauges were fixed to fresh-cut stems of trees, it is evident, that those stems were in a strongly imbibing state; and, consequently, the cankered stock might very likely draw sap from the graft, as well as the graft alternately from the stock; just in the same manner as leaves and branches do from each other in the vicissitudes of day and night.

And this imbibing power of the stock is so great, where only some of the branches of the stock will, by their strong attraction, starve those grafts; for which reason, it is usual to cut off the greatest part of the branches of the stock, leaving only a few small ones to draw up the sap.

The instance of the ilex grafted upon the English oak seems to afford a very considerable argument against a circulation; for, if there were a free uniform circulation of the sap through the oak and ilex, why should the leaves of the oak fall in winter, and not those of the ilex?

Another argument against an uniform circulation of the sap in trees, as in animals, may be drawn from Dr. Hale's thirty-seventh experiment; viz. where it was found, by three mercurial gauges, fixed to the same vine, that, while some of its branches change their state of protruding sap into a state of imbibing, others continued protruding sap, one nine, and the other thirteen days longer.

That the sap does not descend between the bark and the wood, as the favourers of a circulation suppose, seems evident from hence, viz. that, if the bark be taken off for three or four inches breadth quite round, the bleeding of the tree above that bared place will much abate; which ought to have the contrary effect, by intercepting the course of the reflux sap, if the sap descended by the bark.

But the reason of the abatement of the bleeding, in this case, may be well accounted for, from the manifest proof we have in these experiments, that the sap is strongly attracted upwards by the various operation of the perspiring leaves and attracting capillaries; but, when the bark is cut off for some breadth below the bleeding-place, then the sap which is between the bark and the wood below that disbarked place is deprived of the strong attracting power of the leaves, &c. and consequently the bleeding wound cannot be supplied so fast with sap, as it was before the bark was taken off.

But the most considerable objection against this progressive motion of the sap, without a circulation, arises from hence, viz. that it is too precipitate a course for a due digestion of the sap, in order to nutrition: whereas in animals nature has provided that many parts of the blood shall run a long course before they are either applied to nutrition, or discharged from the animal.

But when we consider that the great work of nutrition in vegetables, as well as animals (we mean after the nutriment is got into the veins and arteries of animals) is chiefly carried on in the fine capillary vessels, where

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where nature selects and combines, as shall best suit her different purposes, the several mutually attracting nutritious particles, which were hitherto kept disjoined by the motion of their fluid vehicle; we shall find, that nature has made an abundant provision for this work in the structure of vegetables: all whose composition is made up of nothing else but innumerable fine capillary vessels, and glandulous portions or vesicles.

Upon the whole, he thinks we have, from these experiments and observations, sufficient ground to believe, that there is no circulation of the sap in vegetables; notwithstanding many ingenious persons have been induced to think there was, from several curious observations and experiments, which evidently prove, that the sap does, in some measure, recede from the top, towards the lower part of plants; whence they were, with good probability of reason, induced to think, that the sap circulated.

SAPOTA, a genus of plants of which there are only two species. 1. Sapota with oval leaves. 2. Sapota with spear-shaped leaves.

The first species is a native of the Spanish West Indies, and the second of Jamaica, and most of the West India islands.

Culture of the SAPOTA.

Both these species are propagated by planting the stones, which should be done as soon as they are taken out of the fruit, and the plants remain in their own country till they are about a foot high; after which they should be brought over here in the summer season. During their passage, while they are in a warm climate, they must have some water; but when they come into a colder, they should have very little moisture, and great care must be taken to secure them from salt water.

When they arrive in England, they should be carefully taken out of the tubs, with balls of earth to their roots, and planted into pots, and then plunged into a moderate hot-bed of tanners bark, where they must be shaded from the sun till they have taken new root, and at first sparingly watered; but when they are well rooted, they must often be refreshed with water in hot weather, and have a great share of air admitted to them. If their leaves should get foul, and be infested with insects, which is often the case, they must be washed with a sponge, without which the plants will not thrive.

As the plants grow, they must be shifted into larger pots, but great care must be taken not to over-pot them, which would certainly destroy them. In winter they must be placed in the warmest part of the stove, and be allowed very little water.

SASSAFRAS, a species of the Bay-tree. See the article **BAY-TREE**.

SATTIN-FLOWER. See the article *Sattin Flower*.

SAVIN, a species of Juniper. See **JUNIPER**.

SAVORY, *Satureja*, a genus of plants ranged by Linnæus among the *didynamia gymnospermia*, and of which there are nine species. 1. Savory with heads of flowers terminating the stalks, and spear-shaped leaves. 2. Savory with bunched whorls of flowers, and linear, spear-shaped leaves, or the true Savory. 3. Savory with whorled flowers, and oval, acute-pointed leaves. 4. Savory with woolly whorls of flowers, and the indentures of their cups bristly and hairy, commonly called Mastick Thyme. 5. Savory with corymbuses of flowers upon foot-stalks, growing by pairs, from the wings of the leaves, and bractæ shorter than the cups. 6. Savory with single diverging stalks on the sides of the branches, and sharp-pointed leaves. 7. Savory with two flowers upon each foot-stalk, being the garden or summer Savory. 8. Savory with spiked flowers, and keel-shaped, hairy, spotted leaves. 9. Savory with oval, sawed leaves, and flowers growing in a divided corymbus, terminating the stalks.

The first species is a native of Virginia. The second, sixth, and seventh sorts grow naturally in Italy. The third, and eighth species, are natives of Crete.

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The fourth of Spain. The fifth of many parts of the East, and the ninth of North America.

Culture of the SAVORY.

The first, second, third, fourth, and eighth species are propagated by slips or cuttings, planted during any of the summer months, on a shady border. In eight or nine weeks they will have put out roots, and then they should be carefully transplanted, each into a small pot filled with fresh undunged earth, and kept in the shade till they have taken new root; after which they should be placed in a sheltered situation, where they may remain till the end of October, at which time they must be put under a common hot-bed frame, and there protected from hard frost, and exposed to the open air, whenever the weather is mild.

The fifth species is propagated in the same manner, but being a tender plant, it requires more protection in winter.

The sixth and seventh species are propagated by seeds, which should be sown about the beginning of April, upon a bed of light earth; and if the plants are not to be removed, the seeds should be scattered thinly. When the plants appear, they must be kept clear from weeds, which is all the culture they require.

They may also be propagated by slips, planted in the spring.

The ninth species is never cultivated in England.

SAVOY Spiderwort, a species of Lily Asphodel. See the article *LILY Asphodel*.

SAW-WORT, *Serratula*, a genus of plants of which there are ten species. 1. Saw-wort with wing-pointed leaves, or common Saw-wort. 2. Saw-wort with oblong spear-shaped leaves, downy on their under side. 3. Saw-wort with oblong, oval, acute-pointed, sawed leaves. 4. Saw-wort with linear leaves, and rough empalements. 5. Saw-wort with entire spear-shaped leaves, and rough empalements. 6. Saw-wort with linear leaves. 7. Saw-wort with stiff, spear-shaped leaves, sharply sawed. 8. Saw-wort with oblong, spear-shaped, entire leaves, hairy on their under-side. 9. Saw-wort with oblong, oval leaves, bluntly indented. 10. Saw-wort with oval empalements, a little hairy.

The first and last species are natives of England, and all the rest of North America.

Culture of the SAW-wort.

The first species is never admitted into gardens.

The second, third, seventh, and eighth species are propagated by parting of their roots in autumn. When the plants come up, the only culture they require is to be kept clear from weeds, and to have the ground dug between them every spring. They should not be removed or parted oftener than every third year.

The fourth, fifth, and sixth species are propagated by seeds, which should be procured from America, and sown early in the spring on a border, fronting the east. If the plants should not appear the first summer, which often happens, the ground should not be disturbed, but kept clean from weeds till the following spring, when, if the seeds were good, the plants will appear. If they come up too close, some of them should be carefully drawn out while young, and planted in another border, at four inches distance. In autumn they must all be carefully transplanted to the places where they are designed to remain; which should be in a light, loamy soil, not over wet.

SAXIFRAGE, *Saxifraga*, a genus of plants ranged by Linnæus among the *decandria digynia*, and of which there are no less than thirty-one species, which, as many of them grow wild in this country, and as those admitted into gardens may all be propagated in the same manner, need not be described here.

Culture of the SAXIFRAGE.

All the species of Saxifrage usually cultivated in gardens, may be propagated by off-sets, which are sent out from the old roots in great plenty. They may be taken off at any season when the weather is mild, and, if they are planted in the full ground, they should have a very dry soil, and a shady situation.

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The best season for transplanting them is in July, after their leaves are decayed, when they must be put into undunged earth, and placed in the shade till autumn; but in winter they may be exposed to the sun.

SCABIOUS, *Scabiosa*, a genus of plants ranged by Linnæus among the *tetrandria monogynia*, and of which there are eighteen species; but as many of these grow wild in several parts of England, and few of them are admitted into gardens, it is needless to describe them.

Culture of the SCABIOUS.

The annual sorts of this genus may be propagated by sowing their seeds in a moist shady border, and when the plants come up, they must be kept clean from weeds, and allowed room to spread.

The perennial sorts may be propagated by parting their roots in autumn, and planting them in a soft, loamy soil, and a shady situation; or by slips, which should be planted in a shady border the beginning of April. When they have put out good roots, they may be taken up with balls of earth, and transplanted to the places where they are to remain.

SCAPUS signifies a peculiar kind of stalk, which supports the parts of fructification of a plant, and does not grow from any part of the common stalk, but rises immediately from the root.

SCIATICA *Cressi*. See the article **CANDY-TUFT**.

SCREW-TREE, *Helicteres*, a genus of plants ranged by Linnæus among the *gynandria decandria*, and of which there are three species. 1. Screw-Tree with oval, heart-shaped leaves, which are sawed, woolly on their under side, and a taper twisted fruit. 2. Screw-Tree with heart-shaped, pointed, sawed leaves, woolly on their under side, and a short twisted fruit. 3. Screw-tree with heart-like, crenated leaves, and a hairy twisted fruit. These plants grow naturally in Jamaica and the Bahama Islands. The first species is a shrub about five feet high. The bark is yellowish. The leaves are heart-shaped, sawed on their edges, woolly on their under side, four inches long, and two and a half broad. The flowers grow from the upper part of the branches, upon slender foot-stalks, which are jointed; they are composed of five oblong white petals, and are succeeded by a taper fruit two inches and a half long; and shaped like a screw.

The second species rises with a shrubby stalk ten feet high. The bark is brown and smooth. The leaves are heart-shaped, sawed, end in acute points, and woolly on their under side. The flowers grow from the sides of the branches on short foot-stalks; the fruit is not so long, but twisted in the same manner as the former.

The third species, in its native climate, rises to the height of fourteen or fifteen feet. The bark is of a greyish brown. The leaves are broad, of a strong green, hairy on their upper side, of a hard substance, and have short brown foot-stalks. The flowers grow from the joints of the young branches, sometimes single, sometimes two or three together; they have short foot-stalks, and their colour is a beautiful glossy yellow. The fruit resembles that of the first species.

Culture of the SCREW-TREE.

These plants are propagated by seeds, which should be brought from abroad in the fruit. When they arrive they must be sown in pots filled with good garden mould, covering them about a quarter of an inch with the same earth, then set the pots in a bark-bed of temperate heat; give them a gentle watering, and at night draw a mat over the glass of the frame. In the day remove the mat, and, when the sun is hottest, open the bed a little by raising the glass with a notched stick. Water the earth very gently from time to time; and when the plants appear, continue these waterings, only be careful not to beat down the stalks.

In the spring before the seeds are sown, the following compost should be prepared for them:

Mix two bushels of dry pasture earth, one and a half of large sand, one bushel of wood pile-earth, and one pound of stone-lime. Let this be frequently turned.

Admit the air to the plants in the middle of the day, and when they have got some little height, let them be

transplanted each into a separate pot, filled with the compost, and gently watered, and then set into the bark-bed again. From this time they will only require to be watered and shaded till they are well rooted, and then to be hardened by degrees to the air, by opening the glass of the bed in the middle of the day; and nourished by frequent waterings. When they have thus acquired some strength, they must be removed into the stove, and in the middle of our hottest days, the glasses of the stove must be opened. At times the plants must be shifted into larger pots, filled with the same compost, and the third year they will flower.

SCULL CAP. See the article *Helmet-Flower*.

SEED, according to the definition of Linnæus, is a deciduous part of a vegetable, being the rudiment of a new plant, quickened for vegetation by the sprinkling of the pollen.

The distinctions of a seed are, a seed, properly so called, a nut, and propago: for an account of the two last, see the articles **NUT** and **PROPAGO**.

A seed, properly so called, which is a rudiment of a new vegetable, furnished with sap, and covered with a bladdery coat or tunic, consists of: 1. A corculum, being the first principle of the new plant within the seed. 2. A plumula, being a scaly part of the corculum, which ascends. 3. A rostellum, or a plain part of the corculum, which descends. 4. A cotyledon, or a side lobe of the seed of a porous substance, and perishable. 5. A hilum, being an external mark or scar on the seed, where it was fastened within the fruit. 6. An arillus, or the proper exterior coat or tunic of the seed which comes off of itself. 7. A coronula, or little crown of a seed, which is either the calyx of a floret adhering to the seed, and assisting it to fly, or a down answering the same end, and connected with the seed by a trunk. 8. An alæ, or wing, being a membrane affixed to the seed, which by flying helps to disperse it.

In respect to the number of seeds contained within the fruit, plants are either monospermous, having one seed; diospermous, two; trispermous, three; or tetraspermous, four seeds.

In respect to the number of cells, some have two cells, though the seed in most plants have but one cell. In respect to the figure of a seed, it is either girt, heart-shaped, kidney-shaped, ovate, or egg-shaped, or it is prickly. In respect to substance, a seed is either bony or tough. In respect to size seeds may be very small or very large: and in respect to situation, they are either nesting or dispersed about the pulp, fastened to the future, fastened to the columella, or placed on receptacles.

Every seed consists of an embryo-plant, called plantula seminalis, with its covers. The embryo, which is the whole future plant in miniature, is called the germ or bud, and is rooted in the cotyledon or placenta, which makes its involucre or cover. The cotyledon is always double: and in the middle and common center of the two, is a point or speck: viz. the embryo plantule, which being acted on by the warmth of the sun and of the earth, begins to protrude its radicle or root downwards, and its bud upwards; and as the requisite heat continues, it draws nourishment by the root, and so continues to unfold itself and grow.

The two placentulæ, or cotyledons of a seed, are, as it were a case to the little embryo plant, covering it up, and sheltering it from injuries, and feeding it from their own proper substance, which the plantule receives, and draws to itself by an infinite number of little filaments, which it sends into the body of the placenta. The cotyledons, for the most part, abound with a balsam disposed in proper cells: and this seems to be oil brought to its greatest perfection, while it remains to mid, and lodged in these repositories: one part of the composition of this balsam is oily and tenacious, and serves to defend the embryo from any extraneous moisture, and, by its viscosity to entangle and retain the fine, pure, volatile spirit, which is the ultimate production of the plant.

This oil is never observed to enter into the vessels of the embryo, which are too fine to admit so thick a fluid.

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The spirit however, being quickened by an active power, may possibly breathe a vital principle into the juices that nourish the embryo, and stamp upon it the character that distinguishes the family; after which every thing is changed into the proper nature of that particular plant. Now, when the seed is committed to the earth, the placenta still adheres to the embryo for some time, and guards it from the access of noxious colds, &c. and even prepares and purifies the cruder juice the young plant is to receive from the earth by straining it through its own body. This it continues to do, till the embryo plant being a little inured to its new element, and its root tolerably fixed in the ground, and fit to absorb the juice thereof, it then perishes, and the plant may be said to be delivered; so that nature observes the same method in plants contained in fruits, as in animals in the mother's womb.

Many sorts of seeds will continue good for several years, and retain their vegetative faculty, whereas others will not grow after they are one year old: this difference is in a great measure owing to their abounding more or less with oil, and the texture of their outward covering. All seeds require some share of fresh air, to keep the germen in an healthy state; and when the air is absolutely excluded, the vegetative quality of the seeds will be soon lost. But seeds will be longest of all preserved in the earth, provided they are buried so deep as to be beyond the influence of the sun and showers; since they have been found to lie thus buried twenty or thirty years, and yet vegetate as well as new seeds. How the vegetative life is so long preserved, by burying them so deep in the ground, is very difficult to explain; but as the fact is very well known, it accounts for the production of plants out of earth taken from the bottom of vaults, houses, &c.

In the common method of sowing seeds, there are many kinds which require to be sown soon after they are ripe; and there are many others which lie in the ground a year, sometimes two or three years, before the plants come up: hence when seeds brought from distant countries are sown, the ground should not be disturbed, at least for two years, for fear of destroying the young plants.

As to the method of preserving seeds, the dry kinds are best kept in their pods or outer coverings; but the seeds of all soft fruits, as cucumbers, melons, &c. must be cleansed from the pulp and mucilage which surround them, otherwise the rotting of these parts will corrupt the seeds.

When seeds are gathered, it should always be done in dry weather; and then they should be hung up in bags in a dry room, so as not to deprive them of air.

In sending seeds from one country to another, the great care to be taken is to secure them from vermin, and preserve them dry, otherwise they will mould and decay. The method Mr. Catesby always observed, was to put his seeds dry into papers, and then put them into a dry gourd-shell, and seal them up.

There are some persons who have directed to put them into glasses, and seal them closely down, to keep out the external air: but from several experiments of this kind, which had been made, it was found that seeds thus closely put up will not grow if they remain stopped up any considerable time: all seeds requiring some share of air to preserve their vegetating quality, so that where a person has no other conveniency, they may be put into bags, and hung up in a dry part of the ship, or put in a trunk where they may be safe from vermin, in which place they will keep very well.

But notwithstanding these experiments, it is the opinion of the Reverend Mr. Pullein, that the reason why such seeds did not vegetate, was not because fresh air was excluded, but because the seeds were confined in an air, which, by being pent up, and loaded with the matter perspiring from the seeds, became continually more unwholesome, so as at last to destroy the vegetative principle. From several experiments he has made, he is persuaded that the only method to preserve the vegetative

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principle of seeds, for any long space of time, is, totally to exclude the air, in the following manner: Let some water be heated in a small tin pannicle to such a degree as will just keep tallow or bees-wax fluid: let it be near full of water, so as it may contain only about a quarter or half an inch thickness of melted wax on its surface: set beside it a small vessel of cold water, and by means of a small pair of plyers, with sharp points turned inward, take a seed with its small or germinating end uppermost, and when the wax is melted on the surface of the water, immerge the seed in it with a sudden dip, and then, as quickly as you can, dip it in the cold water; by means of which it will be coated over with wax, without much danger of being hurt by the heat.

Most large seeds may be coated in this manner, and even the smaller seeds, which are contained in dry coriaceous pods, may have the whole pod covered in the same way, which it is imagined will be sufficient to preserve them for as long a time as is necessary; but it should be remembered to let them always have attained a proper degree of hardness and dryness, before they are coated. If melted wax is found to be any way hurtful by too great heat, then melted tallow may be used in its stead. The very small seeds which have thin and tender coats may be preserved by kneading up a quantity of them into small pellets, with clay, and when the pellets are compleatly dry, coating each of them in the manner already directed: or if they are seeds whose berries are pulpy, they may be formed into small cakes or pellets, and then coated with bees-wax or tallow.

In case the seed itself is smeared with tallow or wax, it becomes necessary, before it is sown, to clear it away: to which nothing more is required than to scrape the large seeds with a knife, and the smaller kind may be rubbed in a bag, with soap-water and a little fine sand, in such a degree as their texture will bear, till the wax or tallow is cleared away, and free access given to air and moisture: which, with the addition of heat, are the great instruments of vegetation.

SEGMENTS of leaves, are the parts of such leaves of plants as are divided, or cut into many threads.

SELAGO, a genus of plants that has no English name, and of which there is only one species, ranged by Linnæus among the *didynamia angiospermia*. It is a native of Æthiopia. The root is divided, hard, and hung with innumerable fibres. The stem is woody, and divides at a small height into a great number of branches. The bark on the larger parts is greyish, but on the smaller it is of a pale green, or lightly dashed with a reddish brown. The leaves are small, oblong, sharp-pointed, and stand in clusters at the joints, like pencils. The flowers are also very small, but stand in exceeding thick clusters. They are white, and when viewed at a little distance, each appears to have four small spots of a gold yellow. These are the buttons terminating the filaments, but they seem at some distance placed on the flower.

Culture of the SELAGO.

It is propagated by slips, which should be taken early in spring from a thriving plant, and pierced through in two or three places with a fine awl, and then set into pots filled with the following compost:

A barrow of earth from under the turf of a dry common, a peck of coal-ashes, two pecks of marle, and a pound of fine shavings of horn: this should be mixed in September, and it will then be fit for use in spring.

When all the plants are set, one in each pot, give them a gentle watering, and plunge the pots up to the rim in a bark-bed of a gentle heat, where they must be shaded carefully, and watered every other day, and when they have taken root, admit the air to them by degrees. When they have stood some time in these small pots, let some larger be filled up one fourth with the same compost: then loosen with a thin-bladed knife the earth from the sides of the small pots, and get it out entire: place this with its plant upright in the larger pot, and fill it up carefully with the compost: give a gentle watering, and set them upon the tan in the same bed for some days, watering

watering them every evening. When they are well rooted, they must be inured to the open air by degrees, into which they may be removed in the middle of a warm cloudy day, and set among the exotics. After this they require no particular treatment, they must only be managed as the rest, and at the approach of winter be taken into shelter.

SELFHEAL, *Prunella*, a genus of plants ranged by Linnaeus among the *didynamia gymnospermia*, and of which there are several species, chiefly preserved in botanic gardens for the sake of variety, for they are plants of no great beauty. The most ornamental among them is the Violet Selfheal, the culture of which is a sufficient direction for that of every other species of this genus, though this is only a variety obtained from the common Selfheal of our meadows.

The root of this plant is oblong, irregular, brown, and hung about with many slender and very long white fibres. The first leaves are numerous, and have long slender foot-stalks. They are oblong, indented, very broad at the base, and smaller to the point. The stalk is ten inches high, purplish at the bottom, toward the top of a pale green, and covered with a light velvety down. On each side of the stalk there runs a slight furrow, and at distances there are two knots; the stalk at these is tinged with purple, and there rise from each of the knots two leaves, which have slender foot-stalks, shorter than those from the root; but the leaves resemble the former shape: their colour is a deep strong green, they are smooth on the upper side, and hairy underneath. The flowers are large and very ornamental: they terminate the stalk in a thick short spike. Their colour is a deep and elegant violet blue, but they have no scent.

Culture of the Violet SELFHEAL.

It is propagated by seeds, which should be sown the beginning of August on a border open to the south: the seeds must be scattered very thick, and the closer to the wall the better. In September the young plants will appear, when they must be kept clean from weeds all the winter, and in spring the weakest of them must be pulled up, leaving the strongest at about a foot distance, and this is all the care they require. When they flower if they are not permitted to seed, the stalks being cut off as the flowers fade, more will be produced in their place throughout a great part of the year, and afford a most pleasing variety.

SEMINARY, denotes the seed-plot, or place allotted for raising plants from seed, and keeping them till they are fit to be removed into the garden or nursery. See the article **NURSERY**.

When the Seminary is intended for trees, it must be large, and of a soil adapted to the generality of the trees intended to be raised in it: but that which is most in use is for the supply of the flower-garden, and is the place where flowers are to be raised from their seeds, to procure varieties; or, according to the expression of the florists, new flowers: as also for the sowing all the biennial plants, to succeed those which decay in the flower-garden.

The Seminary should always be situated at some distance from the house, and be walled or paled round, and kept under lock and key, to keep out dogs, &c. and to prevent a great deal of damage that is frequently done by those who are unacquainted with gardening.

The several directions for the management of the Seminary are to be seen under the names of the several plants intended to be raised in it.

Bladder SENNA. See the article **COLUTEA**.

Scorpion SENNA. See the article **CORONILLA**.

SENSITIVE PLANT, *Mimosa*, a genus of plants ranged by Linnaeus among the *polyandria monogynia*, and of which there are several species, all requiring the same culture: we shall therefore confine ourselves to the description of one only; viz.

Thorny SENSITIVE PLANT. It is a native of the Brazils. The root is divided into many parts, and hung with fibres; the stem is round, as thick as a goose-quill,

of a brownish colour towards the base, and greener near the extremities; it is beset at distances with small, brown, hooked, and sharp prickles. The height is about two feet, and it divides into innumerable branches. The bark on the lower part usually cracks and grows rough, but on the younger part it always remains smooth. The leaves are very singular and beautiful. Each is supported on a long tender foot-stalk, which often droops with it; and is composed of five, six, or eight parts, placed in the fingered manner, and each of these is regularly pinnated; the pinnæ being oblong, small, and extremely numerous. The colour is a fresh but not very dark green; and the pinnæ, and their supporting ribs naturally stand wide expanded, but on a touch with the hand, or only on the motion of the air in an approach toward touching it, they collapse and as it were fade; but after a little time of rest the ribs rise to their proper places again; and the leaves expand with their first vigour. The flowers are numerous, collected into a kind of round heads, placed on slender foot-stalks at the extremities of the branches. Their colour at first is a greenish white, but they afterwards acquire a tinge of purple.

Culture of the SENSITIVE PLANT.

It is propagated by seeds, which, early in spring, must be sown upon a common hot-bed, covered four inches with rich garden mould. When the plants appear let them be thinned where they grow too close; and when they have attained the height of three inches they must be transplanted each into a small pot, filled with the richest garden-mould; and when they have had a gentle watering, they must be set up to the rim in a bark-bed of moderate heat. Let the glasses be covered with mats, to shade the plants till they are perfectly rooted; after which let them by degrees be hardened a little, by admitting a small quantity of air in a mild day; and when the plants are grown to some farther bigness, they must be shifted out of these pots into larger: this should be done by shaking them out with the entire lump of mould, and after trimming the straggling fibres, they are to be set upon a little of the fresh mould in the new pot; and then the pot filled up. These must be again set upon the rim in the bark-bed; and shaded till they have recovered the check of this removal. They must then be watered at times; and have some air admitted to them in hot days; and when they have acquired a handsome size, they are to be removed into the stove.

This plant has obtained the appellation of sensitive from its remarkable propensity of receding from the touch, and giving signs, as it were, of animal life and sensation; this motion it performs by means of three distinct articulations, viz. of a single leaf with its pedicle, of the pedicle to its branch, and of the branch to the trunk, or main stem; the primary motion of all which is the closing of the two halves of the leaf on its rib; then the rib or pedicle itself closes; and if the motion wherewith the plant is moved be very strong, even the branches have the sensation propagated to them, and apply themselves to the main stem, as the simple leaves did before to their ribs, and these ribs to their branches; so that the whole plant, in this state, forms itself, from a very complexly branched figure, into a sort of strait cylindrical one.

These motions are wholly independent on one another, as may be proved by experiment. It should appear that if the stalks are moved and collapse towards the branches, or those towards the trunk, that the leaves, whose motion is usually primary to these, should be affected also; yet experiment proves, that it is possible to touch the branches in such a manner, as to affect them only, and make them apply themselves to the trunk, while the leaves feel nothing of the touch: but this cannot be, unless the branches are so disposed, as that they can fall to the trunk, without suffering their leaves to touch any other part of the plant in their passage; because, if they do, they immediately become affected. Winds and heavy rains cause the sensitive plants to shut up their leaves, while easy showers do not at all affect them: it

is plain from hence, that the agitation of the plant by the wind, and the strokes given by the large and hasty drops of rain, are what cause the contraction.

By whatever accident the plant has been made to close its leaves, it always regularly opens them again afterwards. This, however, requires different times, according to several circumstances, as the time of the day, the season of the year, and the more or less vigorous and healthy state of the plant: sometimes this is done in ten minutes, sometimes it requires half an hour: and the manner is not less different than the time; for sometimes the leaves unfold themselves first; and at others the branches, and often all is done at once, and the whole plant seems in motion at a time.

In endeavouring to account for the motions of this plant, Messieurs du Fay and du Hamel have conjectured, that they are performed by means of a kind of very nice and fine hinges, which communicate one with another by very minute and slender cords, which occasion them to act in the manner we see, when the plant is sufficiently disturbed, and these cords shaken; and what gives a strong probability to this conjecture is, that the decayed and dying leaves of this plant perform this motion as regularly and as vigorously, as those which are fresh and full of juice. It seems plain, that, while the juices are evaporating, and the parenchymatous substance of the leaves drying up, these more solid parts, the lines and cordages, retain their figure; and, consequently, if it is by means of these, that the motion is always performed, it will be performed as well in these as in the fresher leaves; which could not be the case were it owing to the juices.

The natural opening and shutting of the leaves of this plant night and morning, varies also according to circumstances of place, temperature, &c. In the month of August a Sensitive Plant was carried in a pot out of its usual place into a dark cave: the motion that it received in the carriage shut up its leaves, and they did not expand for twenty-four hours afterwards. At this time they became moderately open, and was then subject to no changes at night or morning, but remained three days and nights with their leaves in the same moderately open state. At the end of this time the plant was brought out again into the air, where the leaves recovered their natural periodical motions, as strongly as if it had never been in this forced state.

Repeated experiments have proved, that it is not the light of the day which opens these plants, nor the darkness of the night which closes them; neither is it the alternate warmth of the day and cold of the night that produce this effect, since it shuts in nights which are much warmer than the days often are in which it opens, and the increasing the heat of the stove has not been found to have the least effect on the leaves.

The most probable conjecture seems that it is not great heat or cold, such as it can bear, that brings on this effect, but the sudden change from one to the other, and this is confirmed by the following experiment: that if one of these plants is raised under a glass-bell, and it is suddenly taken off, the leaves immediately close, even if it is done in the middle of the day; and it is also observed that the more open or exposed the plant stands, the more strong and lively this effect is produced.

The great heats of summer affect the plant in some degree like cold, causing it to close its leaves a little: but it is always least affected about nine o'clock in the morning, and that is consequently the most proper time to make experiments on it.

On examining this plant there may be observed a small spot, distinguishable by its paler colour in the articulations of its leaves, where the greatest and nicest sensibility is evidently placed.

SEPTEMBER, the ninth month of the year.

In the *Flower-garden*, about the beginning of this month, water the autumnal flowers in the open ground: pick up dead leaves from the stove and green-house plants: stir the earth about such of them as are flowering or going to flower, and give these also slight but frequent waterings: search for slugs, and other vermin

early in the morning: pick away dead leaves from shrubs, and keep the borders clear of weeds, the grass well cut, and the gravel rolled and weeded. Preparation must be made early in this month for plants from the nursery, that are now to be brought into the garden. Let the borders be examined, as to the condition of their soil; some will be found exhausted, others only stiff for want of digging: labour is required for these, but for the others labour and manure. Early tulips should now be put into the ground. It will also be time to plant early anemones. Look over the box-edgings, repair where they are faulty, and take up and replant them where they are grown too large.

About the middle of this month is the great season of transplanting for the flower-garden in the perennial and biennial kinds. The seeds of many of the best flowers and curious plants, which require no additional heat, but only a good soil and rest, should now be sown. When the gardener has planted his borders, and sown his choice seeds, let him go over the ground, and observe what plants have past their flowering. Those from which he intends to save seeds, should be marked for that purpose, tying them up to sticks: but let him make it a constant rule never to let any perennial plant ripen its seed unless he wants it, as nothing weakens the root so much. Cut down the stems close to the ground, and dig the earth round about their roots. About the end of this month the gardener should go over his ground, and see that all the layers are removed from the old roots; if there be any gap or deficiency in the borders planting from the Seminary, fill it up, and see that every part has its plants for the succeeding years flowering. Scatter a little rotten dung, mixed with fresh mould, upon the surface of the borders that want refreshment. The roots of tulips, ranunculus, and anemones should now be planted.

In the *Seminary*, about the beginning of this month, prepare new beds for the several seedlings whose size does not fit them for their places in the garden, though they require to be removed from the beds on which they were raised. The next care is, for those that are to stand longer where they are, clear away all seeds from these. Trim up those shrubs which require the knife, and train the rest by stakes, or cords, to their proper form. Pull up by hand all weeds from among seedling trees and hardy plants, and give good waterings to settle the loose earth about them, after the disturbance from tearing up the larger rooted weeds. Many plants and trees will now require to be removed, not only from the Seminary into their places in the garden, but into different quarters there, as they increase in size, and crowd upon one another. The season for transplanting with least danger or least damage, is just when the leaves are decayed. About the middle of the month break and turn the ground preparing for receiving the trees and shrubs yet to be planted. Water those already set, and clear away weeds from such as are to remain in their places. About the end of the month fill boxes with light, rich earth, for receiving the seeds of such flowers as are long in coming to perfection.

In the *Fruit-garden*, about the beginning of this month, let the gardener dig the ground in which he intends to set new trees. Gather such fruits as are ripe, and preserve the rest. Whenever a wasp is seen it should be destroyed, for one wasp that escapes at this time and survives the winter, will lay the foundation for a swarm; the destruction of them singly at this time, and the seeking and destroying their nests in the spring, are the two great concerns for guarding fruit from those very troublesome devourers of it. Wall-fruit, especially such as grow against old walls, is liable to a small but numerous enemy, the ant. This creature lives in the earth of ill-managed borders, and lurks in the cracks of walls, and in old nail-holes. The gardener must observe which is the case, and should convey into their holes a mixture of brine and soot, which will destroy or dislodge them. About the end of this month propagate gooseberry and currant-trees by cuttings. Prune and train the trees in the forcing-frame. Continue carefully to gather fruit,

and never gather them but in their perfection: this is to be known by their colour and surface.

In the *Kitchen-garden*, about the beginning of September, weeds rise in every place, which must be destroyed with great care by the spade, the hoe, or by the hand; and when the weeds are drawn off the ground, let there come a good watering. Sow Dutch lettuce. Let the celery be earthed as it rises; and as most of the kitchen-garden ground will now be cleared of its crops, some part of it must serve for receiving the transplanted growths for winter, and some must be reserved for the spring sowing. The gardener making the proper separation and disposition now, he will find his work proceed with regularity. Let that division used for the autumnal transplantation be dug deep and well: let it be laid in borders or beds of proper form, and this broke by the spade: let it lie exposed to dew and rain to enrich it, till the time of planting. The other part which is to lie vacant till the spring, should enjoy all the advantages of fallow.

The time for making mushroom-beds is now approaching; the late onions, cabbages, coleworts, and carrots, will be appearing now, and care must be taken to destroy the weeds that will rise with them. Save seeds from all kinds as they ripen. Gather them successively as they are fit, and spread them in an airy, shady place. When they are perfectly dry in the husks, let them be separated and cleared from them: after which they may be spread out a day or two more to harden, and then put up to be ready for use. Broccoli, at this time, requires particular care. Frosts are to be expected soon, and therefore the middle of this month is a season for the latest transplantation. Earth up chardoons with care. In wet days continue transplanting. Transplant coleworts, where they are to stand till the spring. Set out cabbage-plants at distances, in a good piece of mellow ground, where they are to stand till they be removed to the place in which they are to remain.

About the end of the month the gardener should yet sow some young fallading. Dress the asparagus beds and the alleys between the beds, and those alleys will be a fine spot for some colewort-plants. Let a piece of ground be well chosen for a crop of beans and peas: it must be defended from cold, and open to the south sun. The former crop of cauliflowers will be now beginning to get heads; they must be defended from sun and rain, and yet must have a free air. Broccoli will now be in a promising condition; care must therefore be taken to protect it from frosts, and at the same time increase its vigour. Break the earth between the plants to the depth of five inches, and draw a good deal of it about their stalks. The mushroom-beds must be defended from the approaching cold and wet, and should be covered with a ridge of thatch.

Green-house and Stove. The season advances about the middle of this month, when the cold nights will be injurious to tender exotics, which must be defended by taking them into the green-house. As they are brought in, let them be carefully examined. Let all dead leaves be taken off: the earth should then be carefully dug up about their roots, with a small, strong trowel, and a slight covering of fresh mould put over them: they are then to be placed handsomely on the benches, and on the floor. None receive so much benefit from the free air as the succulent plants, they should therefore be suffered to remain in it as long as they can with safety. This is to be determined by the weather; they may sometimes be left out till the beginning of October. Take the advantage of dry days to bring in the plants: let the tender kinds be taken in first, and placed near the front sometime before they are set, where they are to stand the winter. Towards the end of this month the bark-bed must be made for the reception of the stove-plants. The plants must be set in when the warmth begins, and the bed must be watched and examined from time to time, to see that it does not acquire too violent a heat. When the plants are removed into the stove and green-house, the same care and management must be used: the earth

must be stirred a little at the surface, all dead leaves must be taken off, and the branches and stems must be looked over and cleared of foulness and insects.

SERVICE-TREE, *Sorbus*, a genus of plants ranged by Linnæus among the *icosandria trigynia*, and of which there are only two species. 1. Service-tree, with winged leaves, smooth on both sides; commonly called quicken, quickbeam, mountain-ash, and roan-tree. 2. Service-tree, with winged leaves, woolly on their under-side; or the cultivated Service-tree.

The first species is a native of many parts of England, and is cultivated in the nursery-gardens as a flowering shrub.

The second species is a native of the warmer parts of Europe, where the fruit is in great esteem, but, like the medlar, they are not fit for eating till in a state of decay.

Culture of the SERVICE-TREE.

Both these species are propagated by seeds, which should be sown in pots soon after they are ripe; the pots must be placed under a common frame in winter, and in the spring plunged into a moderate hot-bed. When the plants come up they must be kept clean from weeds, and watered in dry weather, exposing them to the open air as soon as they have got a little strength. About the middle of October they must be transplanted into a warm, light spot of ground, and planted in rows two feet asunder, and a foot distance in the rows. During the summer the ground should be kept constantly clear from weeds. In winter there should be a little mulch laid upon the surface about their roots, and in the spring the ground between them should be dug, taking care not to injure or cut the roots of the plants.

In this nursery the plants may continue three or four years, when they should be transplanted to the places where they are designed to remain. They succeed best in a strong, moist soil, and a warm situation.

Wild SERVICE, *Cratægus*, a genus of plants ranged by Linnæus among the *icosandria digynia*, and of which there are nine species: but as some of them grow wild in this country, and such as are propagated here require all the same method of culture, it is not necessary to describe them.

Culture of the Wild SERVICE.

These trees are best propagated by seeds, which should be sown soon after they are ripe. They may also be propagated by layers or cuttings, and they will take root by grafting or budding upon pear-stocks. They require a strong deep soil.

SETTERWORT, a species of Black Hellebore. See the article *Black HELLEBORE*.

SHADDOCK, a species of Orange. See the article *ORANGE-TREE*.

SHEPHERD'S NEEDLE, or **VENUS'S COMB**, *Scandix*, a genus of plants ranged by Linnæus among the *pentandria digynia*, and of which there are eight species. 1. Shepherd's Needle with angular, furrowed seeds. 2. Shepherd's Needle with smooth seeds, and the longest beak. 3. Shepherd's Needle with shining, oval, awl-shaped seeds. 4. Shepherd's Needle with oval, rough seeds, uniform petals, and a smooth stalk. 5. Shepherd's Needle with awl-shaped, bristly seeds, radiated flowers, and smooth stalks. 6. Shepherd's Needle with cylindrical, bristly seeds, a bristly stalk, and tumid joints. 7. Shepherd's Needle with a hairy foot-stalk, and short seeds. 8. Shepherd's Needle with shining, oval, awl-shaped seeds, and decomposed leaves.

The first species is a native of Germany. The second, third, and fourth grow naturally in England, but are never cultivated in gardens. The fifth is a native of Italy and Crete. The sixth of Sicily. The seventh of the east; and the eighth of Virginia.

Culture of the SHEPHERD'S NEEDLE.

The first species is propagated by seeds, which may be sown in any soil or situation, and the plants will rise without farther care.

The fifth, sixth, seventh, and eighth species are propagated by seeds, which if permitted to scatter, will raise

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raise new plants, without any other trouble than that of transplanting them to some abject part of the garden, as they will grow in any soil or situation.

SHEPHERD'S ROD, a species of Teasel. See the article TEASEL.

SHRUB, a vegetable of a genus between a tree and an herb, but of a woody substance, sending forth many stems from the roots, whereas trees have only a single trunk or body. See the article TREE.

SHRUBBY PLANTS, those which are of a hard, woody substance, and do not rise to the height of trees.

SIDESADDLE-FLOWER, *Sarracena*, a genus of plants ranged by Linnæus among the *polyandria monogynia*, and of which there are only two species. 1. Side-saddle-flower, with irregularly swollen leaves. 2. Side-saddle-flower, with closed leaves.

The first species is a native of North America. The root is divided into many spreading parts, hung with numerous fibres. The leaves that rise from this are of an extraordinary form: large, hollow like pitchers, and swelled out into a kind of irregular bunch behind: of a firm substance, supported by strong ribs, and capable of holding a vast deal of water. They begin from a small base, which is usually purplish, and then enlarge by degrees to the place of this irregular swelling: thence they are again contracted upwards into a kind of neck, and from that part they again swell out into a broad opening or mouth, whose edges stand obliquely, and are waved so that they resemble ears. The stalk rises naked in the centre of the tuft of leaves: it is round, upright, and two feet high. On its top stands a single flower, large, open, and of a glowing purple: this has a double cup; the under one is formed of three little oval leaves, and falls with the flower; the upper one is composed of five very large leaves, tinged with the colour of the flower, and adding greatly to its beauty; these fall also with the others.

The second species is a native of Carolina. The leaves are near three feet long, small at the bottom, and widening gradually to the top. They are hollow, and arched over at the mouth. The flowers grow on naked pedicles rising from the root.

Culture of the SIDESADDLE-FLOWER.

The best method of obtaining these plants is to have a parcel of them taken up young in their natural places of growth, with a good ball of earth to each, and set in a tub or box of mould; and they must be watered at times, which will keep them alive during their passage.

On their arrival in England as many large pots must be prepared as there are plants, by filling them halfway up with earth taken from a bog: let each plant with its ball of earth be set upright in one of these pots, and fill round carefully with more of the bog-earth, till the pots are full within an inch and a half: fill up this with rich earth from under a wood-pile, and give the plants a good watering.

The next day, when the earth is a little sunk, lay upon each pot, and all round the bases of the leaves of the plants, a large quantity of the great white sphagnum, fresh gathered from the bog. Pour more water upon this, from a fine-nosed watering pot, and set the pots in a warm sheltered, and somewhat shady place. Repeat the watering every day; and at the approach of autumn take them into the green-house; water them well, and, after a week, remove them into the stove; set the pots up to the rim in bark, and give them frequent but gentle waterings. It is uncertain whether they will flower the first or second year.

SILENE, *Viscous Campion*, a genus of plants ranged by Linnæus among the *decandria trigynia*, and of which there are no less than twenty-seven species: but as all of them are never cultivated in any other than botanic gardens, for the sake of variety, it will be sufficient to describe the following species only. 1. Silene, with entire, roundish petals, and erect fruit, in alternate order to the stalk; commonly called Dwarf Lychnis. 2. Silene, with bifid petals, nodding flowers, growing from the side of the stalks, all turning to one side, and a

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recurved stalk. 3. Silene, with bifid petals, a shrubby stalk, broad, spear-shaped leaves and panicles, divided in threes. 4. Silene, with the lower leaves very blunt and spoon-shaped, and those upon the stalks almost in whorls. 5. Silene, with globular, acute-pointed cups to the fruit, marked with thirty stripes, and smooth leaves. 6. Silene, with swollen, pendulous cups to the fruit, with ten rough angles. 7. Silene, with bifid petals, a stalk divided by pairs, flowers sitting close to the wings of the stalk, and smooth leaves. 8. Silene, with flowers gathered into bunches, and the upper leaves smooth and heart-shaped; commonly called Lobel's Catchfly.

These plants are all natives of different parts of Europe.

Culture of the SILENE.

They are all propagated by seeds, which in autumn should be sown thin upon a border of light earth; and in the spring, when the plants come up, they must be thinned to the distance of four inches, and afterwards kept clean from weeds.

SILIQUEOSE PLANTS, those which produce pods, and are otherwise called Leguminous plants.

Virginian SILK, *Periploca*, a genus of plants ranged by Linnæus among the *pentandria digynia*, and of which there are four species. 1. Virginian Silk, with flowers hairy on the inside. 2. Virginian Silk, with imbricated spikes. 3. Virginian Silk, with a hairy stalk. 4. Virginian Silk, with narrow, spear-shaped leaves.

The first species is a native of Syria; and the second, third, and fourth of the Indies.

Culture of the Virginian SILK.

The first species is propagated by laying down the branches, which, when they have put out roots, may be cut from the old plant, and planted where they are designed to remain, either in autumn after their leaves begin to fall, or in spring before they begin to shoot. They should be placed where they may have a support, otherwise they will trail on the ground, and fasten round every plant in their reach.

The second, third, and fourth species are propagated by laying down their branches; or from seeds, which should be sown upon a hot-bed: and when the plants are come up, they must be treated like other tender exotics.

SILVER-TREE, *Protea*, a genus of plants ranged by Linnæus among the *tetrandria monogynia*, and of which there are only two species. 1. Silver-tree, with oblique, acute, spear-pointed leaves, and floral ones placed verticillately. 2. Spherical-headed Silver tree, with oval, obtuse, imbricated leaves.

These are shrubby plants, natives of Africa, and are cultivated for the beauty of their shining foliage, which resembles silver, and makes a most elegant appearance in the green-house at all seasons.

Culture of the SILVER-TREE.

The first species is propagated by seeds, which should be procured from the places where the plant grows naturally, and sown in small pots, filled with soft sandy loam, and plunged into a moderate hot-bed, giving them a gentle watering every evening. The plants must remain in these pots till they are about three inches high, and then be transplanted each into a separate pot filled with the same earth, and again plunged into the hot-bed, observing to water them duly, to shade them at noon, and to give them air at times, by raising the glasses.

In the middle of summer they should be placed in the open air, in a warm and sheltered situation, and watered at times. They must afterwards be removed into larger pots, and in autumn taken into the green-house: where they must always have as much free air as they can bear, for on this depends the silvery colour of their leaves.

The second species is also raised from seeds, which should be sown in pots filled with light earth, about the beginning of March. Set the pots up to the rim in a bark-bed, and water them gently once in three days. When the plants have obtained a little strength, let them be planted each in a small pot, which must be placed in
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the bark-bed as before. The glasses must be shaded in the middle of the day, and a little air, from time to time, must be admitted, allowing them gentle waterings. When the plants are well rooted they must be shifted into larger pots and taken into the stove.

SILVER-BUSH, or *Jupiter's-BEARD*. See the article *Jupiter's-BEARD*.

SISARUM, a species of Water Parsnep. See the article *Water PARSNEP*.

SISYRINCHIUM, according to Linnæus a species of Iris, but considered by other authors as a distinct genus, of which there are three species: 1. *Sisyrrinchium*, with sword-shaped leaves embracing the stalks. 2. *Sisyrrinchium*, with linear, sword-shaped leaves. 3. *Sisyrrinchium*, with a plaited leaf.

The first species is a native of Bermuda. The second of Virginia; and the third grows naturally in the West-Indies.

Culture of the SISYRINCHIUM.

The first and second species are propagated by seeds, which should be sown in autumn, soon after they are ripe, upon a border where they may have only the morning sun: In the spring the plants will appear, when great care must be taken not to pull them up for grass, which their leaves greatly resemble. During the first summer they will require no other care but to keep them clean from weeds, unless the plants should come up so close as not to have room to grow, in which case part of them should be drawn out, and planted in a shady border at three inches distance. In autumn they must be transplanted to the places where they are to remain, which should be in a shady situation, and a soft, loamy, undunged soil, and the following summer they will flower.

They may also be propagated by parting of their roots, which should be done in autumn, and they will get good root before winter.

The third species is propagated by off-sets from the roots: the time for doing which is soon after the leaves decay, or before the roots begin to shoot again. They must be planted in small pots, and plunged into the tan-bed in the stove, where they should constantly remain.

SKIRRET. See the article *Water PARSNEP*.

SMALLAGE, a species of Parsley. See the article *PARSLEY*.

SNAIL-TREFOIL, *Medicago*, a genus of plants, of which there are a number of species, but the five following are the only ones cultivated in gardens. 1. Snail Trefoil, with branching foot-stalks, snail-shaped, prickly pods, and a trailing woolly stalk; or Sea Medick. 2. Snail Trefoil; commonly called Snails. 3. Snail Trefoil, with a small, smooth fruit. 4. Snail Trefoil, with a large fruit, whose spines point upward and downward; commonly called Hedgehog. 5. Snail Trefoil, with a round prickly capsule, and elegantly cut leaves.

These plants are all natives of different parts of Europe.

Culture of the SNAIL TREFOIL.

The first species is propagated by seeds, which should be sown on a dry, warm border where the plants are to remain: when they come up, two or three of them may be transplanted into small pots, and removed into shelter in the winter. Those plants which are left remaining, will require no other culture but to thin them where they grow too close, and to keep them clean from weeds.

It may also be propagated by cuttings, planted in June or July, in a shady border, covering them close with a glass. They will take root in about six weeks, and may then be planted either in a warm border or in pots, and treated in the same way as the seedling plants.

The second, third, fourth, and fifth species, are propagated by seeds, which should be sown in the middle of April, where the plants are to remain; the plants should be thinned where they rise too close, and kept clean from weeds, which is all the culture they require.

SNAKEKOOT, a species of Birthwort. See the article *BIRTHWORT*.

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SNAKEWORT, a species of Milkwort. See the article *MILKWORT*.

SNAP-DRAGON. See the article *CALF'S-SNOUT*.

SNAP-TREE, a species of *Justicia*. See the article *JUSTICIA*.

SNEEZWORT, a species of *Achillæa*. See the article *ACHILLÆA*.

Austrian SNEEZWORT. See the article *Eternal FLOWER*.

SNOW-DROP, *Galanthus*, a genus of plants ranged by Linnæus among the *hexandria monogynia*. There is only one species, of which there is a variety with double flowers.

This plant is a native of the Alps. The root is a small bulb, composed of many coats or skins, the outer one of which is blackish, the others white, and from the base run many long white fibres. The leaves and stalks rise together, surrounded half their length by a white filmy scabbard. The leaves are long, narrow, and thick; and their colour is a deep green with a blueish tinge. Two of these naturally rise more upright than the rest, to defend and shield the lower part of the stalk: the others spread farther and droop. The stalk is angulated of a paler green, naked, and four or five inches high. Its top droops with the weight of a single flower, which bursts from an oblong flattened scabbard.

Culture of the SNOW-DROP.

It is propagated by parting the roots, and for those which are intended to flower earliest, let a warm sheltered place be chosen, and a bed made up with the following compost:

A load of meadow-earth, half a load of pond-mud, and a quarter of a load of coarse sand, with the same quantity of rotted cow-dung. Let these be well mixed, and the border made up in the middle of August. Toward the end of the preceding May, let the roots be taken up, and planted in this border in bunches at eight inches distance, and buried two inches and a half in the mould, rake the surface over them; and thus let them remain till the end of October; then scatter over the bed a little marle and pigeon's dung mixed together. The rains that follow will wash this in, and it will invigorate the roots just when they are required to shoot for flowering.

The double sort requires no other culture; and the roots should not be parted oftener than every third year.

Great SNOW-DROP, *Leucojum*, a genus of plants ranged by Linnæus among the *hexandria monogynia*, and of which there are only two species. 1. Great Snow-drop with a sheath inclosing one flower, and a key-shaped style. 2. Great Snow-drop with many flowers in a sheath, and a thread-like style.

These plants are natives of Germany, Switzerland, and Italy. The root of the first species is a large bulb, which sends out many fibres from the base. The leaves rise six or eight from each root, enveloped with a whitish film at their bottoms, they are long, moderately broad, obtuse at the end, and of a very fine green. The stalks rise to about ten inches in height; they are of a paler green than the leaves, and somewhat edged; two or three rise from each good root, and each is terminated by a single flower. This is at first wrapped in a scabbard, which serves it as a kind of cup; and is thin and whitish in the middle, and thicker and green at the edges. When this bursts appears the flower, large, and drooping, from the slenderness of its footstalk. The colour is snow-white, except at the tips of the petals, where there is on each a spot of very beautiful green.

The root of the second species is large, round, and covered with a whitish membrane. The leaves are long, and of considerable breadth, sharp-pointed, and of a fine deep green with a tinge of blueish. The stalk is thick, naked, hollow, of the same colour with the leaves but paler, and at its top appears the scabbard containing the flowers. This bursting on the inner side they throw themselves out three or four from each head. They have long and very slender footstalks, and their weight being too much for these tender supports to carry erect,

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erest, hangs them drooping. They are formed like little bells, and in colour are of a perfect snow-white.

Culture of the Great SNOW-DROP.

These plants are propagated either by seeds or by off-sets from the roots. If by seeds, those of the best flowers should be saved with care, and the latter end of August let them be sown in a border facing the east; where the mould has been dug out, and its place supplied with good black earth from under the turf in a fertile meadow; they should be scattered at two inches distance, and covered half a quarter of an inch with the same mould; all the care they will then require is to be watered in dry weather, and to be kept clean from weeds.

When these seedlings have once flowered, they should be treated with care according to their value. The best kinds are to be planted two inches and a half deep, and at ten inches distance; and all the care that is afterwards required for them is to keep the ground clear from weeds; and annually to take up the roots when the leaves are decayed, which will be in the beginning of June; and keep them in paper bags in an airy place till September; then planting them again in a border in the same situation, but with fresh mould. After this some roots may be left in the ground for off-sets, and each year the finest flowers should be marked for seed.

The off-sets should be planted the beginning of September in a border of the same mould, two inches and a half deep; and at ten inches distance, and when the plants come up, they require the same care as the seedlings.

SNOW-DROP, or FRINGE-TREE, *Chionanthus*, a genus of plants, of which there is only one species.

This shrub is a native of South Carolina, where it rises to the height of ten feet. The leaves are about the size of the laurel, but of a thinner substance. The flowers grow in long bunches, and are of a pure snow-white; the petals are cut into narrow segments, which at some distance give the flowers the appearance of a delicate white fringe: they are succeeded by a black berry.

Culture of the SNOW-DROP TREE.

This tree is propagated by seeds, which must be procured from America, and sown in small pots filled with fresh loamy earth, and placed under a common hot-bed frame, where they may remain till the beginning of May, when they must be removed to a situation exposed to the morning sun only, and the following autumn they must be again placed under the hot-bed frame. In March the pots must be plunged into a moderate hot-bed, which will bring up the plants much sooner than they will otherwise rise, by which means they will get more strength the first summer, and be better able to resist the cold of the next winter.

In spring just before the plants begin to shoot, they should be shaken out of the pots, and carefully separated so as not to break off their roots, and each planted in a small pot, filled with light loamy soil, and plunged into a very moderate hot-bed till they have taken root, after which they should be gradually inured to the open air, and during the following summer the pots must be plunged into the ground in a situation where they may enjoy the morning sun, and may be shaded from it at noon. The autumn following they should be again placed under a hot-bed frame, but the air must be admitted to them at all times when the weather is mild. The April following the plants may be shaken out of the pots, with the ball of earth to their roots, and planted where they are designed to remain, which should be in a soft, moist, loamy soil, and a sheltered situation.

SOLDANEL, *Soldanella*, a genus of plants, of which there is only one species.

This plant grows naturally on the Alps, and other mountains in Germany. The root is fibrous. The leaves are of a dark green, and stand upon long foot-stalks. Between these the stalk of the flower rises about four inches high, sustaining at the top two small flowers, whose brim is cut into many fine segments. Their colour is sometimes blue, and sometimes white.

There is a variety of this, which differs from it in having of leaves less round.

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Culture of the SOLDANEL.

It is propagated by parting of the roots; the proper time for doing this is in September, when they should be planted in a strong cool loam, and a shady situation. When the plants come up they should be kept clean from weeds.

SOLOMONS SEAL. See the article *LILY of the VALLEY*.

SOPEBERRY-TREE, *Sapindus*, a genus of plants, of which there are only two species. 1. Sopeberry-tree, with winged, running leaves. 2. Sopeberry-tree, with winged leaves.

These trees are natives of the Indies. The first species rises to the height of thirty feet. The leaves are composed of several pair of spear-shaped lobes. The mid-rib has a membranaceous border running on each side, from one pair of lobes to the other, which is broadest in the middle between the lobes. The flowers are small and white: these are succeeded by oval berries, which inclose a very smooth roundish nut, of a shining black when ripe.

The second species does not rise so high as the former, and differs from it in having no border or wing to the leaves.

Culture of the SOPEBERRY-TREE.

These plants are propagated by seeds, which should be sown in small pots, and plunged into a hot-bed of tanners-bark. In five or six weeks the plants will appear, when the glasses of the hot-bed must be raised every day in warm weather. In three or four weeks they will be fit to transplant, when their roots must be carefully parted, and each planted into a separate small pot, and plunged into the hot-bed again, observing to shade them from the sun till they have taken new root; after which they should have free air admitted to them every day, when the weather is warm, and be frequently watered.

When these plants are well rooted, they should be inured to the open air by degrees, and the plants of the first sort should be placed upon shelves in a stove, where the warmth is very moderate.

The plants of the second species will live in the greenhouse in winter, and in summer may be exposed to the open air.

SOPEWORT, *Saponaria*, a genus of plants, of which there are five species. 1. Sopewort, with oval, spear-shaped leaves. 2. Sopewort, with oval, veined leaves. 3. Sopewort, with oblong, oval, acute-pointed leaves. 4. Sopewort, with oval, spear-shaped leaves, half embracing the stalks. 5. Sopewort, with very small leaves.

Culture of the SOPEWORT.

All these species are easily propagated by seeds, which should be sown where the plants are to remain, and they will require no other care than to be kept clean from weeds, and thinned where they rise too close. If the seeds are permitted to scatter in autumn, the plants will come up without care.

SOPHORA, a genus of plants, of which there are only three species. 1. Sophora, with winged leaves, and oblong, hairy lobes. 2. Sophora, with winged leaves, and roundish lobes. 3. Sophora, with trifoliate leaves, and round, smooth lobes.

The first species is a native of the Levant. The second of the West-Indies; and the third of Virginia.

Culture of the SOPHORA.

The first species is very hardy, and propagates itself fast enough by its creeping roots, without any culture. Great care should be taken not to let it stand near any other plants, which it would soon destroy. The best situation for it, is some abject part of the garden, where nothing else will grow.

The second species is propagated by seeds, which must be procured from the West-Indies, and sown in pots, plunging them into a moderate hot-bed, where, if the seeds are good, the plants will appear in a month or six weeks. When they are fit to remove, they should each be transplanted into a separate pot, and set into a hot-bed of tanners-bark, where they must be shaded from the sun till they have taken new root; after which they

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must be treated like other tender plants from the same countries, which always require to be kept in the bark-stove.

The third species is propagated by seeds, which should be sown the beginning of April on a warm border, in shallow drills; when the plants come up they must be kept clean from weeds, and in autumn, when the stalks decay, they should be carefully taken up, and planted in a warm border where they are to remain.

SORREL, *Acetosa*, a genus of plants ranged by Linnæus among the *hexandria trigynia*, and of which there are several species, most of them weeds growing naturally in this country, and never admitted into gardens: for those which are, the following culture is proper.

Culture of the SORREL.

It is either propagated by sowing the seeds early in the spring on a moist shady border, or by parting the roots in spring or autumn.

Wood SORREL, *Oxalis*, a genus of plants ranged by Linnæus among the *syngenesia polygamia necessaria*, and of which there are thirteen species, but five of these only are cultivated in gardens; viz: 1. Wood Sorrel, with a foot-stalk supporting one flower, trifoliate leaves, and a bulbous root. 2. Wood Sorrel, with one flower on a foot-stalk, and stalks divided by pairs. 3. Wood Sorrel, with an umbelliferous stalk, and trifoliate leaves, divided into two parts. 4. Wood Sorrel, with a branching, diffused stalk, and umbellated foot-stalks. 5. Wood Sorrel, with a branching, upright stalk, and umbellated foot-stalks.

The first, second, and third species are natives of Africa. The fourth of Italy and Sicily; and the fifth of Virginia.

Culture of the Wood SORREL.

The first, second, and third species are propagated by off-sets, which should be planted in pots, and placed under a common frame in winter, where, in mild weather, they should have as much free air as possible. The roots may be transplanted any time before the leaves decay till they come out again.

The fourth and fifth species are propagated by seeds, which should be sown on an open border.

The plants require no care: for if they are permitted to scatter their seeds, they will come up in great abundance.

SORROWFUL-TREE, a species of Arabian Jasmine. See the article *Arabian JASMINE*.

SOUTHERNWOOD, *Abrotanum*, a genus of plants ranged by Linnæus among the *syngenesia polygamia superflua*, and of which there are several sorts to be found in our gardens.

Culture of the SOUTHERNWOOD.

It is propagated either by slips or cuttings, which should be planted about the end of March, on a bed of light fresh earth. If the weather proves dry, let them be moderately watered, and shaded in the middle of the day till they have taken root.

A few sorts there are which must be kept in pots, and will require a green-house in the winter, but should enjoy as much free air as possible in mild weather, and be now and then refreshed with water.

SOWBREAD, *Cyclamen*. See the article *CYCLAMEN*.

SPADIX, properly signifies the receptacle of a palm, but in a more general sense, it signifies the common receptacle of a flower.

SPARAGUS, or Asparagus. See the article *ASPARAGUS*.

SPATHA, a sort of calyx or cup, which consists of a simple membrane, growing from the stalk. This kind of cup is of various figures, often diphyllous, or divided into two parts, often simple, sometimes more divided. It incloses sometimes a flower, sometimes several flowers together, and these have no perianthium. The Spatha is of a very different texture and consistence in different plants.

SPEARMINT, a species of Mint. See the article *MINT*.

King's-SPEAR, *Asphodelus*. See *ASPHODELUS*.

SPEARWORT, a species of *Ranunculus*. See the article *RANUNCULUS*.

SPEEDWELL, *Veronica*, a genus of plants ranged by Linnæus among the *diandria monogynia*, and of which he distinguishes no less than twenty-seven different species: but as several of them grow naturally in this country, and others are rarely admitted into gardens, it is needless to describe them; we shall therefore only make mention of ten: viz. 1. Speedwell, with spikes of flowers terminating the stalks, and four or five leaves at each joint. 2. Speedwell, with spikes of flowers terminating the stalks, and three leaves equally sawed, growing at each joint. 3. Speedwell, with spikes of flowers terminating the stalks, and three leaves unequally sawed, growing at each joint. 4. Speedwell, with spikes of flowers terminating the stalk, and acutely-pointed, sawed, spear-shaped, opposite leaves. 5. Speedwell, with spikes of flowers terminating the stalks, crenated, obtuse, opposite leaves, and an erect, woolly stalk. 6. Speedwell, with a spike of flowers terminating the stalk, obtuse, crenated, opposite leaves, and a single ascending stalk. 7. Speedwell, with a spike of flowers terminating the stalk, rough, obtuse, sawed, opposite leaves, and an erect stalk. 8. Speedwell, with spikes of flowers growing upon foot-stalks, and springing from the sides of the stalks, opposite leaves, and a trailing stalk, being the common male Speedwell or Fluellin. 9. Speedwell, with lateral bunches of flowers, oval, plain leaves, and a creeping stalk; commonly called Brooklime. 10. Speedwell, with lateral bunches of flowers, rough, heart-shaped, indented leaves, and a strait stalk, or false germander.

All these are perennial plants; and the sixth, seventh, eighth, and ninth species are natives of England.

Culture of the SPEEDWELL.

All the species are propagated by parting their roots at Michaelmas, and require no other care but to be kept clean from weeds, and to be transplanted every second or third year.

They may be also propagated by seeds sown in autumn in a shady border.

SPERMACOCE, a genus of plants of which there are only two species. 1. Smooth Spermacoce, with stamina included in the flower. 2. Spermacoce, with stamina standing out of the flower.

These plants grow naturally in moist places in Jamaica, where the inhabitants call the second species Button-weed.

Culture of the SPERMACOCE.

Both these species are propagated by seeds, which should be sown upon a hot-bed; and when the plants come up they must be transplanted on a second hot-bed, where they must remain till they have attained some height, after which they must be removed each into a separate pot, and placed in the stove, where they must be treated in the same way as other tender plants.

SPIDERWORT, *Anthericum*, a genus of plants ranged by Linnæus among the *hexandria monogynia*, and of which there are nine species. 1. Spiderwort, with plane leaves, a branching stalk, and flowers turning backward. 2. Spiderwort, with plane leaves, a branching stalk, and plane petals. 3. Spiderwort, with plane leaves, and a single stalk. 4. Spiderwort, with fleshy, taper leaves, and a shrubby stalk. 5. Spiderwort, with fleshy, plane, awl-shaped leaves. 6. Spiderwort, with awl-shaped, fleshy, half taper leaves, growing close. 7. Spiderwort, with awl-shaped, fleshy, taper leaves. 8. Spiderwort, with sword-shaped leaves, and downy stamina. 9. Spiderwort, with sword-shaped leaves, a cup with three lobes, and smooth stamina.

The three first species are natives of the southern parts of Europe. The fourth, fifth, and sixth grow naturally at the Cape of Good Hope. The seventh in Ethiopia. The eighth upon bogs in the north parts of Europe; and the ninth grows upon the mountains of Switzerland, Lapland, and Siberia: but the two last are never preserved in gardens but for the sake of variety.

Culture of the SPIDERWORT.

The first, second and third species are propagated by seeds, which should be sown in autumn on a bed of light sandy earth, and in a warm situation. When the plants come up, let them be kept clear from weeds; and in autumn, when the leaves decay, be transplanted into another such bed, at the distance of one foot. In this bed let them remain for one year, and in the following autumn they may be removed into the borders of the flower-garden.

In a severe winter, they will require to be covered with straw, or such light covering, to keep out the frost; but if some old tan can be procured, and spread over the ground, it is preferable to any thing else.

The fourth fifth and sixth species are propagated by off-sets, which should be planted in pots, filled with light sandy earth, where they will soon take root, and must be treated like other succulent plants which come from the same country. In winter they must be placed in the green-house.

The seventh species is propagated by seeds, which should be sown on a warm border of light earth in April. The plants will only require to be kept clean from weeds, and thinned where they rise too close.

Savoy SPIDERWORT, a species of *Lily Asphodel*. See the article *Lily Asphodel*.

SPIGNET, *Athamanta*, a genus of plants ranged by Linnæus among the *pentandria digynia*, and of which there are eight species. 1. Spignet with plane leaves doubly winged, an hemispheric umbel, and hairy seeds. 2. Spignet with pinnated, angular, cut leaves. 3. Spignet with divaricated leaves, called *Oreoselinum*. 4. Spignet with the under leaves shining, the primordial umbels sessile, and the seeds hairy. 5. Spignet with linear, plane, hairy leaves, the petals divided into two parts, and the seeds oblong, and hairy. 6. Spignet with the leaves divided into many narrow, roundish, pointed segments. 7. Spignet with membranaceous striated seeds, and smooth leaves, more than decomposed, and cut into many segments. 8. Spignet with hair-like leaves, and smooth striated seeds, called *Meum*.

The first species grows naturally upon dry stony fields in Sweden and Germany. The second and fourth species are natives of Siberia, the third grows naturally upon hilly places in England, France, and Germany. The fifth is a native of Switzerland, and the eighth of the hills of Switzerland, Italy, and Spain. The sixth grows naturally in Crete, but the native place of the seventh is uncertain.

Culture of the SPIGNET.

The first, second, third, fourth, fifth, and eighth species may be propagated, by sowing their seeds soon after they are ripe, or by parting of the roots in autumn. They require a shady situation and a moist soil.

The sixth and seventh species are also propagated by seeds, which should be sown in autumn upon an open bed of light dry ground. When the plants come up, they should be thinned, and kept clean from weeds, which is all the culture they require.

SPIKE, a part of a stalk, thick set with flowers, or fruit, in such a manner as to form an acute cone.

Ploughman's SPIKENARD, *Baccharis*, a genus of plants ranged by Linnæus among the *syngenesia polygamia superflua*, and of which there are six species. 1. Ploughman's Spikenard with spear-shaped leaves, sawed and indented longitudinally. 2. Ploughman's Spikenard with oval spear-shaped, sawed leaves, and a shrubby stalk. 3. Ploughman's Spikenard with spear-shaped leaves, and one or two sawed denticles at the top. 4. Ploughman's Spikenard with ovated leaves, emarginated and crenated at the top, or groundsel-tree. 5. Ploughman's Spikenard with oval indented leaves. 6. Ploughman's Spikenard with spear-shaped, sawed, and indented leaves, with a leafy corymbus.

These are all shrubby plants. The first species is a native of Peru and Virginia; the second and third of Africa; the fourth and sixth of Virginia; and the fifth

grows naturally in India, but is not to be found in our gardens.

Culture of the Ploughman's SPIKENARD.

The first, second, and third species may be propagated either by cuttings or by seeds, but the best method is by cuttings, which should be planted on a shady border, during any of the summer months. If they are raised from seeds, they should be sown in spring.

If planted in a warm situation, these shrubs will live abroad in mild winters; but they are usually kept in green-houses, and placed abroad in the summer.

The fourth and sixth species are propagated by cuttings, planted on a shady border in any of the summer months, and watered properly in dry weather till they have taken root; and in autumn they may be transplanted to the places in which they are designed to remain.

SPINACH, or **SPINAGE**, *Spinacia*, a genus of plants ranged by Linnæus among the *dioecia pentandria*; and of which there are two species. 1. Spinach with prickly seeds. 2. Spinach with smooth seeds.

There are two or three varieties of the first species now cultivated in the kitchen-gardens, which differ in the size and shape of their leaves.

Culture of the SPINACH.

The seeds of the first species, which is by much the hardiest, and therefore fittest to be cultivated for winter use, should be sown in August upon an open spot of rich, light, and well loosened ground, if possible, just before a shower of rain: but if rain does not fall in two or three days after the sowing, the ground must be watered.

When the plants come up and have got good strength, the ground should be well hoed to destroy the weeds, and to thin the plants to the distance of three or four inches asunder. This, like all other hoeings, should always be performed in dry weather, the more effectually to kill the weeds: or, if it be rainy, they should be carried off the ground as soon as they are cut up, to prevent their taking fresh root: for if many of them spring up, and the season proves wet, they will stifle the plants of Spinach, and make them rot. A second careful hoeing is therefore necessary in about a month or five weeks after the first; and with the help of this the spinach will begin to be fit for use by the end of October. The best way of gathering it is, to crop off only the largest outer leaves, and to leave the middle ones to grow bigger: for by this means a regular supply may be had during the whole winter, and even till the subsequent spring sowing shall have produced plants large enough for use, which generally is in April. The winter Spinach will also then be ready to run up, and should therefore be entirely cleared off, unless a parcel be left for seed, if wanted. But if early cabbages, which will want earthing up, have been planted among this Spinach, as is the usual practice of the gardeners about London, a separate small spot of ground should be allotted purposely for sowing some of this Spinach for seed, without any other plants among it, and to cut up all the remains of the other winter crop, as soon as the spring Spinach is fit for use.

The oblong oval-leaved Spinach, commonly called **Plaintain Spinach**, which has thicker leaves and more succulent stalks than the former sort, is sown in the spring likewise upon an open spot of fine rich earth. The London gardeners, who always endeavour to have as many crops in a season as they possibly can, generally mix radish seeds with those of the Spinach which they sow at this season; but the best way for those who have ground enough, is to sow the Spinach seeds alone. This crop must be hoed, cleared from weeds, and thinned in the manner before directed for the winter Spinach; and when the plants which were at first left three or four inches asunder, have grown so as to meet, it will be right to cut them out here and there for use, and to thin them in this manner, as they are wanted for the table, till those that are left stand eight or ten inches asunder. The thinnings in the mean time will give the remaining plants room to spread: and, if after the last, the ground between them is well stirred to a good depth, and

and kept perfectly clear from weeds; this sort of Spinach will frequently produce leaves as large as those of the broad-leaved dock, and extremely fine.

A succession of Spinach may be had throughout the whole season, by sowing it every three weeks, from about the middle of January to near the end of May, only observing that the earliest sowings must be upon the driest soil, and that the latest must be thinned most at their first hoeing, because the remains of the former crops will furnish a supply till these are full grown, and the plants will not be so apt to run up to seed when they stand at a distance from each other, as when they are close together.

In order to have good seeds of Spinach, each particular sort should be sown by itself, in an open spot of rich, well-dug ground. This sowing should be in February, as soon as the danger of frost is over: and when the plants are come up, they should be thinned with a hoe till they are six or eight inches asunder every way. All weeds at the same time should be carefully cut up, and carried away: and in about three weeks or a month after this, the plants should be hoed and thinned a second time. Their distance from each other should then be enlarged to at least twelve or fourteen inches: for they will cover the ground very sufficiently after they have shot out their side branches. Particular care is requisite at this time to keep them very clear from weeds, because they would make the plants of Spinach run up very weak, and thereby greatly injure them.

When the plants run up to flower there will be found among them male and female, which may be easily distinguished, as the male plants will produce spikes of staminate flowers; these contain the farina which are to impregnate the female plants, so as to render the seeds prolific; therefore they should not all, as is the common method, be pulled up, but a few of them left in every part of the ground.

When the seeds begin to ripen they must be guarded from birds: and when they are thoroughly ripe, which is known by their changing their colour, and beginning to shed, the plants should be drawn up, and spread upon cloths for a few days, to be compleatly dried by the heat of the sun, turning them every other day: and when they are quite dry they should be threshed out, well cleaned, and laid up in a dry place, where mice cannot come at them.

SPINDLE-TREE, or PRICKWOOD, *Euonymus*, a genus of plants ranged by Linnæus among the *pentandria monogynia*, and of which he distinguishes only two species. 1. Spindle-tree, the greatest part of whose flowers are divided into four points; or the common Spindle-tree. 2. Spindle-tree, with all the leaves cut into five points.

Both these are shrubby plants. The first grows naturally in the hedges in most countries in Europe, and particularly in England: of this sort there are two varieties, the narrow-leaved, and the broad-leaved Spindle-tree.

The second species is a native of North-America. It is an evergreen shrub, which flowers in July, but never produces fruit in this country.

Culture of the SPINDLE-TREE.

The first species may be propagated either by seeds or by layers: if by seeds, they should be sown in autumn soon after they are ripe, and then the plants will come up the spring following; but if the seeds are not sown till spring, the plants will not appear till the next year; they require a shady border, and when the plants come up they must be kept clear from weeds till the following autumn: then, as soon as their leaves decay, they should be taken up and transplanted into a nursery, in rows two feet distant, and one foot asunder in the rows: here they may stand two years, and then be removed to the places in which they are designed to remain.

When these plants are propagated by layers, the young shoots should be laid down in autumn, and if the joint which is laid deepest into the ground is slit, it will cause them to put out roots much sooner than they otherwise would do. In a year's time the layers will be

sufficiently rooted to bear transplanting, when they may be treated in the same way as the seedlings.

The cuttings of these sorts planted in a shady border will take root, but they should be planted in autumn, as soon as their leaves begin to fall. They ought to be shoots of the same year, with a knot of the former year at bottom.

The plants of the second species must be obtained from the place where it is native, and on their arrival they should be planted in pots, and plunged into the tan-bed, where they must be treated like other plants from hot countries.

SPIRÆA, a genus of plants ranged by Linnæus among the *icosandria pentagynia*, and of which there are eleven species. 1. Spiræa, with spear-shaped, obtuse, naked, sawed leaves, and flowers in double branching spikes; commonly called Spiræa, Frutex, or Shrubby Spiræa. 2. Spiræa, with spear-shaped leaves, unequally sawed, and woolly on their under-side, and flowers growing in doubly branching bunches; or the Meadow-sweet of Virginia. 3. Spiræa, with intire leaves, and umbels of flowers sitting close to the branches; or the Shrubby Hypericum. 4. Spiræa, with oval, cut, sawed, smooth leaves, with umbels of flowers growing upon foot-stalks. 5. Spiræa, with oblong leaves, the points of which are sawed, and flowers growing in a corymbus on the sides of the branches. 6. Spiræa, with lobated, sawed leaves, and flowers growing in a corymbus, terminating the stalk; or the Opulifolia, commonly called Virginia Guelder Rose, with a curran leaf. 7. Spiræa, with winged leaves, uniform, sawed lobes, a shrubby stalk, and flowers growing in panicles. 8. Spiræa, with more than decomposed leaves, paniculated spikes, male and female flowers; or the Aruncus, Barba Capræ, or Goat's Beard. 9. Spiræa, with winged leaves, uniform, sawed lobes, an herbaceous stalk, and flowers growing upon slender foot-stalks at the top, being the common Dropwort. 10. Spiræa, with winged leaves, the outer lobe of which is greater and is divided into lobes, and flowers growing in bunches on slender foot-stalks; being the Meadow-sweet, or Queen of the Meadows. 11. Spiræa, with trifoliate, sawed, and almost equal leaves, and flowers growing in a kind of panicle.

These are all shrubby plants. The first grows naturally in Siberia and Tartary. The second in Philadelphia. The third species is a native of Canada. The fourth, fifth, and seventh of Siberia; and the sixth, eighth, ninth, tenth, and eleventh of North-America.

Culture of the SPIRÆA.

The first, second, sixth, and seventh species, may be propagated by suckers from the stems of the old plants, or by laying down the tender branches, which, when rooted, should be transplanted out in rows, at the distance of three feet one from another, and the plants about a foot asunder in the rows. In this nursery let them remain two years, in which time the ground should be kept clear from weeds, and that between the rows should be dug up in the spring. If the plants put out suckers from the roots, they should be taken off, and afterwards the plants should be removed to the places where they are designed to remain, which should be either in small wilderness quarters, or in clumps of flowering shrubs.

The third, fourth, and fifth species may be propagated by laying down the under branches, which when they have taken root, may be cut off, and transplanted into a nursery, where they may be managed in the manner directed for the preceding sorts.

The eighth species may be propagated by parting of the roots in autumn: it thrives best in a moist soil and a shady situation; but this, and the ninth and tenth species are seldom cultivated in gardens.

The eleventh species is propagated by seeds, which should be sown in a shady border soon after they are ripe. When the plants are come up let them be kept clear from weeds, and in the autumn after the leaves begin to decay, they must be either transplanted to the places where they are designed to remain, or planted in a nursery

nursery border, where they may stand a year or two. They should have a moist soil and a shady situation.

SPURGE, a species of the Burning Thorny Plant. See the article *Burning Thorny Plant*.

SPURGE LAUREL, *Daphne*. See the article *DAPHNE*.

SQASH, a species of the Gourd. See the article *GOURD*.

SQUILL, *Scilla*, a genus of plants ranged by Linnæus among the *hexandria monogynia*, and of which there are eight species. 1. Squill, with a coated root. 2. Squill, with a scaly root. 3. Squill, with a solid root, and an hemispherical corymbus of flowers. 4. Squill, with a solid root, and a conical corymbus of flowers; commonly called Hyacinth of Peru. 5. Squill, with a solid root, and flowers growing alternately from the sides of the stalk, almost nodding. 6. Squill, with a solid root, and erect flowers growing thinly. 7. Squill, with a solid root, slender, linear leaves, flowers growing in a corymbus, and naked foot-stalks rising over each other to the length of the flowers. 8. Squill, with a thick, roundish, spiked leaf.

These are all perennial plants. The first species is a native of Spain, Sicily, and Syria, growing on the sea-shores, and in ditches where the salt water flows in with the tide, and is never cultivated in gardens.

The second species grows naturally in some parts of Spain, France, and the Pyrenees; the third, fourth, and eighth in Portugal; the fifth in Byzantium; the sixth in France and Germany; and the seventh in several parts of England.

Culture of the SQUILL.

These are all hardy plants, and may be propagated by seeds or off-sets; the seeds should be sown in autumn soon after they are ripe, either in shallow boxes or pans, and treated in the same manner as was directed for the hyacinths; but the most expeditious way of propagating them, and that most generally practised, is by off-sets: the roots should be transplanted after the leaves are decayed, and they may be in other respects treated like the seedling plants.

STÆHELINA, a genus of plants of which there are only two species. 1. Stæhelina, with woolly leaves. 2. Stæhelina, with almost three-cornered leaves.

Both these plants are natives of the Cape of Good Hope.

Culture of the STÆHELINA.

Both species are propagated by cuttings, which, if planted in any of the summer months, and covered close with a bell or hand-glass, will soon take root, after which they should be taken up carefully, and planted in pots filled with light, fresh earth, but not over rich, and placed in the shade till they have taken new root. In autumn they must be removed into an airy glass-case, where they must remain all the winter.

STALK, that part of a plant which rises immediately from the root, and which supports the flowers and the fruit. The term stalk is used on all occasions; but in speaking of grasses and gramineous plants, the word culm is used in its place, to distinguish that peculiar kind of stalk, which is general to all these plants, and is not found in any other.

The terms used in describing the stalk of a plant, are,

1. *Simple STALK*, one which runs up undivided from the root to the top: this is called *naked* when it has no leaves; *foliose*, when it has leaves on; *ramose*, when it sends out branches; *erect*, when it rises up strait; *oblique*, when slanting; *voluble*, when it twists round other things; *flexous*, when it bends; *reclinate*, when it stoops toward the ground; *procumbent*, when it lies on the ground; *creeping* and *sarmentous*, when it emits roots as it runs along.

2. If the Stalk be rounded in shape, it is called *round*; if it makes two angles, *ancipital*; if three, *trigonal*; if four, *square*; if more, *polygonal*; if it be lightly ridged, and furrowed on the surface, it is said to be *striated*; if more deeply so, *caniculated*, or *channelled*; if full of pro-

tuberances, *scabrous*; if lightly hairy, *villose*; if more roughly so, *trispid*.

3. In the *branched STALK*, if the branches rise erect, it is expressed by *ascendent*; if they spread, by *diffuse*; if they are very large, it is called *brachiated*.

4. If the stalk divaricate, or instead of sending out branches, divides into them, it is called a *composite stalk*; if these divarications proceed by pairs, or every branch is divided into two others, it is *dichotomous*; if it part into two series of branches, it is expressed by the term *distichous*; if it parts into a multitude of ramifications, *subdivided*. All these terms are used in expressing the different state of the culm. When a stalk has no articulations, it is called *equal*, when scaly, *squamose*.

STAMINA, the male parts of a flower, or its male organs of generation. Linnæus defines the Stamina the entrail of the plant, designed for the preparation of the pollen. See *POLLEN*.

Each stamen consists of two parts. 1. The filament or thread, which serves to elevate the anthera or summit, and at the same time connects it with the flower. 2. The anthera, or summit itself, which contains within it the pollen, and when come to maturity, discharges the same.

The stamina being the male part of the flower, the construction and distribution of the sexual system, is principally founded upon, and regulated by them. Such flowers as want the stamina, are called female flowers: such as have the stamina, but want the pistillum, or female part, male flowers: such as have them both, hermaphrodite flowers; and such as have neither, neuter flowers.

Mr. Tournefort takes the use of the stamina to be, as it were, so many excretory canals for discharging the growing embryo of its redundant juices; and of these excrements of the fruit, he takes that farina, or dust, found in the apices, to be formed. But other writers, as Geoffroy, and Linnæus in particular, assign the stamina a nobler use: these authors, explaining the generation of plants in a manner analogous to that of animals, maintain the use of the stamina to be that of secreting, in their fine capillary canals, a juice, which being collected, hardened, and formed into a farina, or dust, in the tops of the apices, is thence, when the plant arrives at maturity, discharged by the bursting of the apices upon the top of the pistil, whence is a passage for it to descend into the uterus, where being received, it impregnates and fecundifies the plant. See *BOTANY*, *GENERATION of Plants*, *FARINA*, and *PISTIL*.

On this principle it may be said, that the same flower contains both sexes, which contributes each their part to the generation: that the stamina are the male part, and the farina, which is always found of an oily glutinous nature, the seminal liquor; and that the pistil is the female part, which conducts the semen to the ova or embryos.

Among the writers of the present age, who oppose this doctrine, is Dr. Alston, late professor of botany at Edinburgh, who, in an express dissertation on the sexes of plants, published in the *Physical Essays*, undertakes to overthrow all the arguments in favour of the sexes of plants, by repeated experiments. This author, considering that there are several species of vegetables which bear flowers on one plant, and seeds on another, as *spinacia*, *mercurialis*, *cannabis*, &c. in order to determine the controversy, thought of training up one or more of these seed-bearing plants at a sufficient distance from those that carry flowers, and observing the consequence. Accordingly in spring 1737, he transplanted three sets of the common spinach, long before it could be known whether they were flowering or seed-bearing plants from a little bed, on which it was raised, into a place of the garden full eighty yards distant, and almost south, there being two hawthorn and three holly-hedges, all very thick and tall, between them and their seed-bed, and no other spinach in the garden, or near; these we are told proved all fertile plants, and ripened plenty of seeds; and that these seeds, being sown, grew, and prospered, as well as any spinach could do.

The same author in spring 1741, made other separate experiments on the common hemp, and the French mercury; each of which plants, notwithstanding they were planted in a very high inclosure, many hundred yards distant from any other of the same class of plants, he assures us, ripened fertile seeds.

STAMINEOUS, a term used by botanists, for those flowers of plants which have no petals, or flower-leaves, but consist only of a number of stamina and pistils, placed in a cup. This cup is sometimes mistaken for a flower, and its leaves thought to be true petals, but they remain when the stamina are fallen, and become the capsules, containing the seed; which, according to Tournefort, is the true character of a cup, not of a flower.

STANDARD, or **VEXILLUM**, the name of a petal in papilionaceous flowers, placed above the carina, or keel, and covering the other petals. See the articles **PAPILIONACEOUS**, **KEEL**, and **ALÆ**.

STANDARD-TREES. See the article **TREES**.

STAR of Bethlehem. See the article **Star FLOWER**.

STARWORT. See the article **ASTER**.

STELLATE PLANTS, those whose leaves grow not less than six at a joint, and are arranged like the rays of a star.

STIGMA, the summit of the pistil, which is covered with a moisture for the breaking of the pollen. See the article **PISTIL**.

STOCK JULY-FLOWER, or **GILLY-FLOWER**, *Cheiranthus*, a genus of plants ranged by Linnæus among the *tetradynamia filiquosa*, and of which there are ten species. 1. Stock with spear-shaped, indented leaves, an erect stalk, and four cornered pods. 2. Stock with spear-shaped, acute, smooth leaves, being the common yellow *Leucosium*, or *Wall-flower*. 3. Stock, with spear-shaped, indented leaves, and pods with awl-shaped points. 4. Stock with spear-shaped, intire, obtuse, hoary leaves, compressed pods with truncated points, and a shrubby stalk, commonly called the *Queen's Stock Gilly-flower*. 5. Stock with spear-shaped, indented, obtuse, hoary leaves, cylindric pods with acute points, and an herbaceous stalk, commonly called *Ten-weeks Stock*. 6. Stock with narrow, sinuated leaves, sessile flowers with waved petals, and a shrubby stalk. 7. Stock with indented, obtuse leaves, smooth cups, and knotty pointed pods. 8. Stock with lacerated, indented, pointed leaves, hairy cups, and knotty pointed pods. 9. Stock with the points of the pods indented into three parts. 10. Stock with leaves which grow close together in heads, turn backward, and are waved.

These plants are all natives of different parts of Europe. The third, fifth, seventh, eighth, and ninth species, are annuals. The first, second, and tenth, are biennials, and the rest are perennial plants. One rule of culture serves for the production and preservation of all the species, and their innumerable varieties.

Culture of the STOCK-JULY-FLOWER.

They are all to be propagated by seeds; the best time for sowing them is in the beginning of April, upon a border of fresh light earth, where they may enjoy the morning sun; for if they are exposed to too much sun, or sown on too dry a soil, they are usually destroyed while young by a sort of fly; and the only way to guard against this is, to sow a few radishes on the same ground, for the flies being very fond of their leaves, will leave those of the stocks untouched; but the radishes must not stand too thick, for it would weaken the plants.

When the young plants have got about six leaves, they should be transplanted to borders of light earth, where they may also enjoy the morning sun; and here they should stand at four inches distance, and be watered and shaded till they have taken root; and in the latter end of August following they may be transplanted to the places in the flower-garden where they are to remain, and they will flower the succeeding spring. This last transplanting should, if possible, be done in a wet season.

As these are mostly annual and biennial plants, they should be sown every year; and it is an excellent method to exchange seeds annually with a person who raises good flowers at a distance from you.

They may also be propagated by slips and cuttings: but they never are so strong, or flower so well as when raised from seeds.

STOEBE, a genus of plants of which there is only one species.

This plant is a native of the Cape of Good Hope. It rises with a ligneous stalk, three feet high. The leaves are short, hooked, and of a greyish colour. The flowers grow at the ends of the branches, and are of a yellow colour.

Culture of the STOEBE.

It is propagated by cuttings or slips, which should be planted in July upon a bed of soft loam, and covered close down either with a bell or hand-glass, shading them every day from the sun till they taken root: then they must be gradually inured to the open air, and afterwards taken up and planted in pots, placing them in the shade till they have taken new root; then they may be placed in a sheltered situation with other tender exotic plants, and in autumn they must be removed into shelter, for they are too tender to live through the winter in the open air.

STOECHAS, a genus of plants of which there are three species. 1. *Stoechas*, with spear-shaped, linear leaves, and short foot-stalks to the flowers. 2. *Stoechas*, with spear-shaped, linear leaves, and long foot-stalks to the flowers. 3. *Stoechas*, with winged, indented leaves.

These plants are all natives of Spain: and the first likewise of the south of France.

Culture of the STOECHAS.

The first and second species are propagated by seeds, which must be sown in March, on a bed of light dry soil, and when they come up they should be carefully cleared from weeds until they are two inches high, at which time they should be removed; and, for which there must be a spot of light dry ground prepared, and laid level, which must be trodden out in beds, into which the plants should be planted at about five or six inches distance each way, observing to water and shade them till they have taken root, after which they will require no further care but to keep them clear from weeds the following summer: but, if the winter should prove severe, it will be proper to cover them with mats, to guard them against the frosts, which otherwise would be apt to injure them while they are so young; but in March, or the beginning of April, the following spring, they must be removed into the places where they are to remain, observing, if possible, to transplant them in a warm moist season, and not to let them remain long above ground, for if their roots are dried they seldom grow well after.

The third species is propagated by slips or cuttings, which if planted in April will take root very freely; and when rooted, must be planted in pots, that they may be sheltered from severe frost in winter, for they are too tender to live in the open air through the winter in England, especially while they are young: but when they have obtained strength, some of them may be turned out of the pots, and planted in a warm situation, upon a dry rubbishy soil, where they will be stunted from growing too vigorously, so will endure the cold much better than if they were growing in better ground.

STONE CROP. See the article *Lesser HOUSELEEK*.

STONE CROP-TREE, a species of *Goose-foot*. See the article *GOOSE-FOOT*.

STORAX-TREE, *Styrax*, a genus of plants ranged by Linnæus among the *dodecanaria monogynia*, and of which there is only one species.

This plant is a native of Syria, Judæa, and Italy. It rises with a woody stalk twelve or fourteen feet high. The leaves are oval, of a bright green on their upper side, and hoary on their under. The flowers, which are white, grow in bunches, and are succeeded by roundish berries.

Culture of the STORAX-TREE.

It is propagated by seeds, which, toward the latter end of summer, must be sown in pots filled with fresh, light earth, and plunged into a moderate hot-bed. When the plants are come up they should be gradually inured to the open air, into which they should be removed

removed in June, placing them in a sheltered situation, where they must be kept clean from weeds, and watered in dry weather. In autumn set them under a common hot-bed frame, where they may be secured from hard frosts in winter, and enjoy as much free air as possible in mild weather.

In the spring, before the plants begin to shoot, they should be shaken out of the pots, and their roots carefully parted, transplanting each into a separate small pot filled with fresh, light earth, and plunged into a very moderate hot-bed, where they must be watered and shaded till they have taken new root, after which they should be hardened by degrees to the open air, in which they may be placed in June, and about the end of October they must be removed into shelter for the winter season.

After the plants have been in the pots four years, they may be turned out of them, and planted in the full ground against a wall with a south aspect, to which their branches should be trained, as is practised with fruit trees: but in very severe frosts it will be proper to cover the branches with mats, straw, or other light covering.

STOVE. See the article HOT-HOUSE.

STRAWBERRY, *Fragaria*, a genus of plants ranged by Linnæus among the *icosandria polyginia*, and of which there are four species. 1. The Wood Strawberry. 2. The Scarlet Strawberry. 3. The Hautboy Strawberry. 4. The Chili Strawberry.

The first species is a native of England. The second of Virginia; and the third and fourth of America.

Culture of the STRAWBERRY.

All the species and varieties of Strawberries may be raised from seeds: but the common, and most expeditious way of propagating them is from their runners, which easily take root at their joints, and there form plants, which, in two or three months, are fit to be cut off and transplanted. Those which root earliest in the spring, and nearest to the mother plant, are the fittest for this purpose: and the best time for removing them is in October, that they may get new roots before the hard frosts set in. They should never be taken from old neglected beds, where the plants have been suffered to run into a multitude of suckers, nor from any but the most fruitful plants.

The ground in which they are planted must be well dug, and very carefully cleared of weeds; and when it is levelled, it should be marked out into beds three feet and an half, or at most four feet wide, leaving a pathway of two feet, or two and an half broad between them. These paths are necessary for the convenience of gathering the fruit, for weeding and dressing of the beds, and, which is of essential consequence to plants that remain so long in the ground as these do, to be frequently dug up, in order to lay fine fresh earth to the roots of the plants.

Of the wood-strawberry, four rows may be planted, in a quincunx order, at about eight inches from each other in the rows, and a foot distance from row to row, in the beds that are four feet wide: but three rows in a bed three feet wide will do much better, because they will be more benefited by the digging of the alleys. The scarlet strawberry must be planted at a foot distance every way, and the hautboy at sixteen inches. The Chili strawberry, which is the largest of all, must be set about two feet distance from plant to plant: this last is found to succeed best under the shade of the trees, in a very strong brick earth, approaching nearly to clay: but it seldom perfects its fruit here, so as to answer the trouble of cultivation.

If the winter prove severe, some old tanner's bark, or if that cannot be easily procured, saw-dust, sea-coal ashes, or decayed leaves of trees, should be spread over the surface of the bed, between the plants, to keep out the frost. This care is absolutely necessary to the Chili strawberry, which is frequently killed in hard winters.

In the spring, after the danger of hard frost is over, the ground between the plants in the beds should be forked with a narrow three-pronged fork, to loosen it

and break the clods: and if the tan, or other covering, which was laid on in the autumn, is then mixed with and buried in the earth, it will be of service to the plants, especially in strong land. A covering of moss spread over the beds about the latter end of March, or the beginning of April, will not only keep the ground moist, by preventing the drying winds of the spring from penetrating it, and thereby contribute greatly to secure a good crop of fruit; but it will also preserve the fruit clean from that grit which is often thrown up by heavy rains after it is full grown, to the great detriment of its flavour, because it must then be washed before it can be eaten.

When the plants begin to flower, they must be watered very plentifully if the season is dry, and great care must be taken to keep them clear from weeds. At Michaelmas the beds should be forked again, the weedings should be repeated carefully, the alleys should be dug, and the weeds destroyed, all the strings or runners must be taken from the roots, and the plants should be thinned, by pulling up the weakest, wherever they stand too close together. The throwing of a little fine earth over them, at that time, will also greatly strengthen their roots.

As these beds seldom continue good above three years, in the common way of managing them, and as they yield but little fruit the first year; it is necessary to new plant some fresh ground every third year. When this is done, the old beds may be destroyed, and the ground converted to some other use, after the new ones have had one year's growth. But that strawberry beds may be made to yield good crops even for some years longer than the abovementioned usual term of their duration, is perhaps more than probable, if they are cultivated according to the principles of what is called the new husbandry.

The indefatigable M. de Chateauvieux, among his numerous and judicious trials of that husbandry, upon different plants, applied it to strawberries, of which he planted several beds of well and deeply loosened earth, six feet wide, with single rows. The vigour of the plants, the largeness of their leaves, and the very great number of their roots, though cultivated only by stirring of the ground with the horse-hoe, without the least help of dung, manure of any kind, or watering even in the driest weather, gave him room to expect, before the first summer was over, that their fruit would be very large and plentiful the next year: nor was he disappointed; for in 1754, which was their second year, his strawberries were admirable, extremely large, finely scented, and of a very high flavour. He continued the same method in 1755 and 1756, and with the same success as before. In short, though the year 1755 was so extremely hot and dry, that no watering could well suffice to keep alive the plants that were managed in the common way; these remained constantly green, and in great vigour, and their fruit was, in every respect, finer than that on which the utmost care was bestowed in his kitchen garden.

An ingenious writer in the *Museum Rusticum* has obliged the world with the following method of cultivating strawberries.

"I have them, says he, of several kinds; and the fruit, in the season, is in great perfection, being large, and possessing a fine flavour. These I procure with no great trouble or difficulty in the cultivation.

"I plant them in regular rows on beds three feet wide. The soil I choose for them is a good, natural, fresh, rich loam: the less it requires of manure the better, the fruit being the sweeter and finer.

"On each of these beds above-mentioned, I plant three rows of plants, in quincunx order, at fifteen inches distance every way; and I rather choose to plant them each on a little hillock, as it were, something in imitation of hops.

"Between the beds are intervals of the same width.

"My next care is, by frequent hoeing, to keep my plants as clear from weeds as possible, by which they are sure to be supplied with plenty of nourishment; a matter of great consequence, particularly when the fruit is set, as then they require most, and the weeds are also at that

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that season most luxuriant : I therefore then stir the earth with the hoe often, which answers, as I said before, a double purpose.

" I observe to keep my plants as clear as possible from runners; by which means my fruit is larger, and sooner ripe, than it would otherwise be.

" When my strawberry plants have borne fruit two successive years on the beds, I get the alleys, or intervals, dug up and prepared, into which I transplant them in the same manner they were planted in the first-mentioned beds, which then become in their turn the intervals.

" Here they remain two years more, when I again remove them into fresh land prepared for the purpose, in this manner never letting them bear fruit more than two years in one spot.

" I cannot easily describe to you the great benefit this method of management is of to the plants, which are thereby greatly invigorated, and the fruit prodigiously improved, both in point of size and flavour, inasmuch that they appear to be quite of a different nature from those of my neighbours, who first furnished me with the plants."

STRAWBERRY BLITE. See the article BLITE.

STRAWBERRY SPINACH, a species of Blite. See BLITE.

STRAWBERRY-TREE, *Arbutus*. See the article ARBUTUS.

STROBILUS, a sort of pericarpium, formed of a number of vaginæ, with contorted points applied close to one another.

STYLE, is a part of the pistil of plants, and is of various figures, but always placed on the germen : it gives origin to the stigma. In some plants it is extremely short, and in others it seems entirely wanting. See the articles PISTIL, STIGMA, and GERMEN.

SUCCORY, *Chichorium*, a genus of plants ranged by Linnæus among the *syngenesia polygamia aqualis*, and of which there are three species. 1. Succory with a single stalk, and indented, sinuated leaves. 2. Succory with a single stalk, and entire crenated leaves, or common endive. 3. Succory with a prickly stalk divided by pairs.

The first species grows naturally by the sides of roads, and in shady lanes in this and most other countries of Europe, and is never admitted into gardens.

For an account of the second species, see ENDIVE : to which article we also refer the reader, for the culture of the third sort; as it is proper for it in every respect.

SUCCULENT PLANTS, such whose leaves are thick, and abound with juice.

SULPHUR-WORT. See the article HOGS-FENNEL.

Sweet SULTAN, a species of Centaury.

This plant is a native of Tartary, and rises with a round channelled stalk near three feet high. The leaves are jagged, smooth, and of a pale green. The flowers grow from the sides of the branches; they have a very strong odour, and their colour is sometimes white, sometimes flesh-colour, and at others purple.

There are two varieties of this plant, the first having fistular flowers; and the second with fringed flowers, commonly called Amberboi, or Emberboi.

Culture of this Sweet SULTAN.

It is propagated by seeds, which should be sown on a hot-bed in the spring, and when the plants have obtained some strength, they may be transplanted into the borders of the flower-garden. The seeds may also be sown on a warm border in autumn, and the plants removed in the spring into the flower-garden.

Yellow Sweet SULTAN, another species of Centaury.

This plant has greatly the appearance of the former, but requires a different culture as being much more tender.

Culture of the Yellow Sweet SULTAN.

The seeds of this plant must be sown in the spring upon a hot-bed, and when the plants are fit to remove, they should be transplanted on a fresh hot-bed. When the plants have obtained some strength, they must be carefully taken up, and planted in separate pots, filled with light earth, and placed in the shade till they have

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taken root, after which they may be removed into the pleasure-garden.

But the plants thus placed in the open air seldom ripen their seeds : so that the best method is to keep two or three plants in a moderate hot-bed, under a deep frame, where they will flower much earlier than the others, and being protected from wet and cold, will ripen their seeds every year.

SUMACH, *Vitrus*, a genus of plants ranged by Linnæus among the *pentandria trigynia*, and of which there are twelve species, but six of these only are cultivated in gardens. 1. Sumach with winged, obtusely sawed, oval leaves, hairy on their under side. 2. Sumach with winged, intire leaves, and a jointed, membranaceous foot-stalk. 3. Sumach with trifoliate leaves, angular rhomboidal lobes, standing upon foot-stalks, and downy on their under side. 4. Sumach, with trifoliate leaves, and linear, spear-shaped, intire lobes, standing upon foot-stalks, and downy on their under side. 5. Sumach, with trifoliate leaves, and smooth, wedge-shaped, sessile lobes. 6. Sumach, with single, obverse, oval leaves.

The first species is a native of the southern parts of Europe. The second of North America. The third and fifth, of the Cape of Good Hope. The fourth grows naturally in Ethiopia : and the sixth species is a native of Lombardy in Italy.

Culture of the SUMACH.

The two first species are shrubby plants, and are easily propagated by seeds, which should be sown in autumn, either in the full ground, or in pots. When sown in pots, they should be placed under a common frame in the winter, and in spring let them be plunged into a very moderate hot-bed. When the plants come up, they should have a large share of air, and be hardened by degrees to bear the open air, into which they may be removed as soon as the weather is favourable, placing them so as to have the morning sun. Let them be kept clean from weeds, and in dry weather supplied with water. In the autumn following the pots may be removed again under a common frame, observing never to cover them but in frost. The following spring, just before the plants begin to shoot, they should be shaken out of the pots, carefully separated, and then transplanted into a nursery, three feet asunder, and at one foot distance in the rows. In this nursery they may stand two years to get strength, after which they may be transplanted to the places where they are designed to remain.

The seeds which are sown in the full ground may be covered the first winter with some old tanners-bark, which in the spring should be drawn off, when the danger of hard frost is over. When the plants come up they must be kept clean from weeds, and in the spring following be carefully taken up, and transplanted into a nursery as before directed; but the easiest method of propagating these plants is by suckers : they are also propagated by layers and cuttings.

The third, fourth, and fifth species are too tender to live through the winter in the open air of this country : for which reason they are planted in pots or tubs, and housed in autumn, and in the winter they may be treated in the manner of other hardy green-house plants; they are propagated by cuttings.

The sixth species is propagated by layers, which should be laid down in autumn. In the autumn following they may be taken from off the old plants, and transplanted into a nursery, where, after they have continued a year or two, they may be planted in the places where they are designed to remain.

Myrtle-leaved SUMACH, *Coriania*, a genus of plants of which there are only two species. 1. Male Myrtle-leaved Sumach. 2. Female Myrtle-leaved Sumach.

These plants are natives of France. They seldom rise more than four feet high, but send forth a number of stems, so as to form a thicket.

Culture of the Myrtle-leaved SUMACH.

Both species are propagated by the suckers, which must be taken off in autumn, and planted in a nursery, where they may stand one or two years, and then be removed to the places where they are to remain : which should

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should be in wilderness quarters that have vacancies to fill up, for they are plants improper for a small garden.

SUMMITS, APICES, or ANTHERÆ. See the article **ANTHERÆ**.

SUN-FLOWER, *Helianthus*, a genus of plants ranged by Linnæus among the *syngenesia polygamia frustranea*, and of which there are ten species. 1. Sun-flower, with all the leaves heart-shaped, veins uniting behind at the base, but towards the border naked; commonly called Annual Sun-flower. 2. Sun-flower, with the under leaves heart-shaped, veins uniting behind at their base, and the upper leaves oval; commonly called Perennial Sun-flower. 3. Sun-flower, with oval, heart-shaped leaves, with the nerves uniting in the leaf; commonly called Jerusalem Artichoke. 4. Sun-flower, with a stalk smooth on the under-side, heart-spear-shaped leaves, and ten petals in the rays. 5. Sun-flower, with a spindle-shaped root. 6. Sun-flower, with rough, spear-shaped leaves, and a slender stalk, smooth towards the bottom. 7. Sun-flower, with smooth, spear-shaped, sawed leaves. 8. Sun-flower, with narrow leaves. 9. Sun-flower, with oblong, opposite, oval, sessile leaves, three veins; and a dichotomous panicle. 10. Sun-flower, with oval, rough, crenated leaves, with three nerves, the scales of the cup erect, and as long as the disk of the flower.

All these species are natives of different parts of America. The second sort is most proper for large borders in great gardens: it begins flowering in July, and continues till October.

For an account of the third species, see the article **Jerusalem ARTICHOKE**.

Culture of the SUN-FLOWER.

The first species is propagated by seeds, which should be sown in March upon a bed of common earth. When the plants come up they must be thinned where they grow too close, and kept clean from weeds; and when they are about six inches high, they should be taken up with balls of earth to their roots, and planted into the large borders of the pleasure-garden, where they must be watered till they have taken new root, after which they will require no other care but to be kept clean from weeds.

In July the great flowers upon the tops of the stems will appear, amongst which the best and most double flowers should be preserved for seeds.

All the other species are propagated by parting their roots, which spread and increase greatly. The best time for doing this is about the middle of October, soon after the flowers are past, or very early in the spring: and the plants will only require the common care of being watered and kept clear from weeds.

SUN-FLOWER, or Dwarf CISTUS, *Helianthemum*, according to Linnæus a species of the Cistus or Rock Rose: but by other botanists considered as a distinct genus, of which they enumerate too many species to be described here, especially as they all require the same culture.

Culture of the SUN-FLOWER or Dwarf CISTUS.

All the perennial sorts of this plant may be propagated by seeds, which should be sown in the places where the plants are to remain: they will require no other culture but to keep them clear from weeds, and to thin them where they grow too close, always observing to leave those plants at the greatest distance from each other, whose stalks trail on the ground and grow the longest.

These plants will continue several years in a poor dry soil; but in rich ground, or moist situations, they seldom last long.

The annual sorts are also propagated by seeds, which should be sown on a bed of common earth in April. When the plants come up they will require no other care but to thin them where they grow too close, and to keep them clean from weeds.

Bastard SUN-FLOWER, *Helinia*, a genus of plants ranged by Linnæus among the *syngenesia polygamia superflua*, and of which he reckons only one species.

This plant is a native of North America, where it rises to the height of six or seven feet. The leaves are

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smooth, with intire edges. The flowers are yellow, and resemble in shape the Sun-flower, but are much smaller.

Culture of the Bastard SUN-FLOWER.

It may be propagated either by seeds or by parting of the roots, which last method is usually practised in this country, because the plant seldom perfects seed here. The roots should be transplanted and parted in October, when their flowers are past, or in the beginning of March, just before they begin to shoot. They should be carefully watered if the season requires it, and should not be removed oftener than every other year, if they are expected to flower strong.

If it is propagated by seeds they should be sown in March upon a bed of light earth, where they often remain a twelvemonth before the plants appear. When they come up, if the season proves dry, they should be often watered, and thinned where they grow too close. In May they must be transplanted into another bed, allowing a foot distance between them: here they must be shaded till they have taken root, and watered in dry weather. In autumn they may be transplanted to the places where they are to remain.

Dwarf SUN-FLOWER, *Rudbeckia*, a genus of plants ranged by Linnæus among the *syngenesia polygamia frustranea*, and of which there are five species. 1. Dwarf Sun-flower, with composite, jagged leaves. 2. Dwarf Sun-flower, with under leaves, having three lobes, and the upper ones entire. 3. Dwarf Sun-flower, with oval, spattle-shaped, undivided leaves, and the petals of the rays indented. 4. Dwarf Sun-flower, with oval, spear-shaped, undivided leaves, placed alternate, and the petals of the ray bifid. 5. Dwarf Sun-flower, with opposite, spear-shaped, oval, sawed leaves, and the petals of the ray bifid.

The several species of this plant are natives of North-America.

Culture of the Dwarf SUN-FLOWER.

The first species is propagated either by sowing the seeds, or parting the roots: but the finest plants are obtained from seeds, which should be sown early in the spring upon a bed of light earth; the plants should be removed in autumn into the places where they are intended to flower, allowing a large space, clear, between them.

The second species is propagated by off-sets, which should be parted in the spring, and planted in a dry soil and a warm situation.

The third species is propagated by off-sets or slips planted in the spring, in a dry soil and a warm situation: but the best plants are raised from seed, which is seldom produced in great perfection in this country, it should therefore be procured from America. This sort has a root which will continue four or five years, but when care is not taken to shelter it in the winter, the plants are often destroyed by cold, or too much wet.

The fourth and fifth species may also be propagated by slips or heads, but the best way is to raise the plants from seeds.

Dwarf SUN-FLOWER, *Tetragonotheca*, a genus of plants of which there is only one species.

This plant is a native of Carolina. It seldom grows above two feet high. The leaves are large, oblong, and rough. The flowers are yellow, and resemble the Sun-flower in shape.

Culture of this Dwarf SUN-FLOWER.

It is propagated by seeds, which should be procured from Carolina, and sown in the spring in the full ground, where sometimes they will remain a year before the plants come up, all which time the ground must be kept weeded; and when the plants appear, they must be kept clean from weeds, and, if the season proves dry, they will require frequent waterings. In autumn they should be transplanted to the places where they are to remain.

The roots of this plant are perennial, and will abide through the winter in the full ground, if they are planted in a warm situation: but in very severe weather they should be covered over with rotten tan, or pease-haulm, to keep out the frost.

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SURIANA,

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SURIANA, a genus of plants of which there is only one species.

This plant is a native of the West-Indies, where it rises with a thick shrubby stalk nine feet high. The leaves are rounded at the point, and of a dingy green colour. Between the leaves are placed the foot-stalks of the flowers, which are about an inch long, and each sustains two, three, and sometimes four yellow flowers.

Culture of the SURIANA.

It is propagated by seeds, which must be sown on a hot-bed early in the spring: and when the plants come up they must be carefully weeded, and frequently refreshed with water. In warm weather the glasses of the hot-bed should be raised every day, to admit fresh air to the plants. When they are fit to remove they should be taken up carefully, and each planted in a separate small pot, and plunged into a hot-bed of tanners-bark, where they must be shaded till they have taken new root: after which they must have fresh air admitted to them every day in proportion to the warmth of the season. In autumn the plants must be removed from this hot-bed into the stove, and placed in the bark-bed, where they must remain all the winter, frequently refreshing them with water, in very small quantities. In summer they must enjoy a large share of air, by opening the glasses of the stove, and if the leaves have contracted any filth, it must be carefully washed off with a sponge.

SWALLOW-WORT, *Asclepias*. See the article **ASCLEPIAS**.

SWEET WILLIAM, a species of Carnation.

Of the Sweet Williams there is a great variety, and very elegant diversities of colouring; the principal difference however is between the single and the double kinds.

Culture of the SWEET WILLIAM.

The single kinds are to be propagated by sowing their seeds in March, on a bed of light earth; in May they must be planted out, at six inches distance, in beds of the same earth, where they should remain till Michaelmas, and then be transplanted to the places where they are designed to stand. They will flower in May, and perfect their seeds in August, when that of the best flowers should be saved.

The double kinds are propagated by layers, in the same manner as carnations; they love a middling soil, neither too light nor too stiff: they continue flowering a long time, and are very beautiful; especially a variety called the Mule, which produces yearly two full blooms of flowers, the one in May, the other in July.

SYCAMORE TREE, a species of the Maple-Tree. See the article **MAPLE-TREE**.

SYCAMORE, a species of fig-tree. See **FIG-TREE**.

SYRINGA, *Lilac*, a genus of plants ranged by Linnæus among the *diandria monogynia*, and of which there are only two species. 1. Syringa with oval, heart-shaped leaves. 2. Syringa with spear-shaped leaves, commonly called Persian Jasmine.

Both these plants are natives of Persia. There are three varieties of the first sort, which differ in the colour of their flowers, and also in that of their shoots and leaves; one of these has white flowers, one blue, and the third purple. These shrubs all grow to the height of eighteen, and often twenty feet.

Culture of the SYRINGA.

These plants are generally propagated by suckers, which should be carefully taken from the roots of the old plants in autumn, and planted in rows, three feet asunder, and one foot distance in the rows here they may stand a year or two to get strength, and then they should be removed to the places where they are designed to remain; which should be upon a light rich soil. But as these plants put out such plenty of suckers from the roots as will starve them, if they are not annually taken off, the best way of propagating the plants is by seeds, which should be sown soon after they are ripe: the plants will come up the following spring, and generally flower the third year. The autumn is the best time for transplanting these shrubs.

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SYRINGA, **MOCK-ORANGE**, or **PIPE-TREE**, *Philadelphus*, a genus of plants ranged by Linnæus among the *icosandria monogynia*, and of which there are only two species. 1. Syringa with leaves somewhat indented. 2. Syringa with entire leaves.

The first species is a shrubby plant, but the place where it grows naturally is uncertain. The second species is a native of Carolina, but is seldom met with in the English gardens.

Culture of the SYRINGA or MOCK-ORANGE.

The first sort is propagated by suckers, which should be taken from the old plants in autumn, and planted in a nursery, where they may remain a year or two till they have obtained strength, after which they may be transplanted to the places on which they are designed to stand; they are hardy, and will grow in almost any soil or situation.



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TABERNÆMONTANA, a genus of plants of which there are only two species. 1. Tabernæmontana with spear-shaped leaves. 2. Tabernæmontana with oblong, oval, acute-pointed leaves.

The first species is a native of several islands in the West Indies. It rises about sixteen feet high, and the bark, which is smooth, abounds with a milky juice. The leaves are thick, having many veins from the midrib to the border, and are full of the same milky juice. The flowers grow in bunches from the wings of the stalk, they are small, of a bright yellow colour, and have an agreeable odour.

The second species is a native of La Vera Cruz. It is about twelve feet in height. The leaves are oblong, oval, and of a lucid green, and a thick consistence. The flowers grow, in large round bunches, at the ends of the branches; they are white, extremely small, but have a most agreeable scent.

Culture of the TABERNÆMONTANA.

These plants may be propagated either by seeds or cuttings. If by seeds they should be procured from the places where they grow naturally, and sown early in the spring on a hot-bed: and when the plants come up, they must be carefully transplanted into small pots, filled with rich, light earth, and plunged into a hot-bed of tanners-bark, where they must be shaded in the heat of the day till they have taken new root: after which they should always have free air admitted to them in proportion to the warmth of the season; but, if the nights prove cold, the glasses of the hot-bed should be covered every evening with mats, soon after the sun goes off from the bed. The plants must be often refreshed with a little water, for if it is given in too great quantities it will cause them to rot. During the summer season the plants may remain in this hot-bed, observing at times to stir up the tan, and to add a little new, that the heat of the bed may not decrease: but at Michaelmas they must be plunged into the bark-bed in the stove, where they must always remain, keeping them in a moderate degree of warmth, and allowing them very little water; and in warm weather free air must be admitted to them, by opening the glasses of the stove.

If they are propagated by cuttings, they should be cut off from the old plants during the summer season, and laid to dry six or seven days in the stove; after which they should be planted in pots filled with light, fresh earth, and plunged into a hot-bed of tanners-bark, where they must be covered close with a hand-glass, and shaded from the sun in the middle of the day, allowing them at times

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times a little water. When they have taken root they may be transplanted into separate pots, and treated in the same manner as the seedling plants.

TAMARIND-TREE, *Tamarindus*, a genus of plants of which there is only one species.

This tree is a native of the Indies. It rises with a large stem a considerable height, and divides into a number of branches toward the top. The leaves are composed of sixteen or eighteen pair of lobes, a little hairy, and of a bright green. The flowers grow from the sides of the branches, and are succeeded by thick, compressed pods, from two to five inches long, full of an acid pulp.

Culture of the TAMARIND-TREE.

It is propagated by seeds, which should be sown on a hot-bed in the spring. When the plants come up they must be transplanted each into a separate small pot, filled with light rich earth, and plunged into a hot-bed of tanners-bark, where they must be watered and shaded till they have taken fresh root: after which they should have air admitted to them according to the warmth of the season, and the bed in which they are placed.

When their roots have filled the pots, they should be shifted into larger, and again plunged into the hot-bed: and when they have taken new root they may be treated in the same manner as the coffee-tree.

TAMARISK, *Tamarix*, a genus of plants ranged by Linnæus among the *pentandria trigynia*, and of which there are only two species. 1. Tamarisk, with flowers furnished with five stamina. 2. Tamarisk, with flowers furnished with ten stamina.

The first species is a native of Spain, France, and Italy, and grows to be a tree of a middling size. The second species is a shrub which grows naturally in Germany.

Culture of the TAMARISK.

These plants are propagated by laying down their tender branches in autumn; or by cuttings, which should be planted in an east border: either way, they must be supplied with water in dry weather, and in the following autumn removed into a nursery to be trained up two or three years, or else into the places where they are designed to remain, taking care to mulch their roots, and water them as the season may require, till they have taken root; after which they will require no other culture but to prune off the straggling shoots, and keep the ground clean about them.

TAN, or *Tanners-BARK*, the bark of the oak chopped and ground in a mill, into a coarse powder, to be used in tanning or dressing of skins, after which it is of great use in gardening.

Its fermentation is very lasting and very equal: hence it is the most valuable of all things for the making of hot-beds. It was introduced into England by the Dutch, in the reign of king William, for the raising of orange-trees: but after this period it became disused, and it is of a much later date that it has been brought into use again for the raising pine-apples, since which time it is become generally used, wherever it is to be had, for all the purposes of the hot-bed, in raising tender plants.

There are several sizes of Tan, and they heat in a different manner in proportion to their size, the smallest heating much quicker, and cooling again in a shorter time: and the largest acquiring its heat more gradually, but keeping it much longer. The gardener should therefore use one or other of these, or a mixture of both, according to the several occasions he wants them for.

Tan should always be taken within a fortnight after it comes out of the pit, and laid up in a round heap for a week, to drain out the moisture: after which it should be formed into a bed; for the method of doing which, see the article HOT-BEDS.

TANSEY or **TANZY**, *Tanacetum*, a genus of plants ranged by Linnæus among the *syngenesia polygamia superflua*, and of which there are eight species. 1. Tansey, with winged leaves, whose lobes are linear, growing at a distance from each other, and are entire. 2. Tansey, with many pointed, winged leaves, and linear, divided, and acute segments. 3. Tansey, with wing-pointed

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leaves, and spear-shaped, intire, obtuse segments. 4. Tansey, with winged leaves, cut into linear, thread-like segments, a small corymbus, and an herbaceous stalk. 5. Tansey, with doubly-winged, woolly leaves, and an oval, compound corymbus. 6. Tansey, with doubly wing-pointed, linear, acute leaves, and a woolly corymbus. 7. Tansey, with doubly-winged, cut, and sawed leaves; or the common yellow Tansey. 8. Tansey, with oval, intire, sawed leaves; or Costmary, or Alecoast.

The first, second, and third species are shrubby plants, and natives of Ethiopia.

The fourth species is a native of Siberia. The fifth species grows naturally in the east. The sixth sort is a native of Spain.

The seventh species is a native of England, and grows by the sides of roads and the borders of fields; and the eighth is a native of Italy.

Culture of the TANSEY.

The three first species are propagated by cuttings, which may be planted in beds of loamy earth, during any of the summer months; they must be shaded from the sun till they have taken root, and frequently watered: after which they may be taken up with balls of earth about their roots, and planted in pots placed in a shady situation. When they have taken root they may be placed among other hardy exotic plants, where they may remain till late in October: then let them be removed into shelter, but they should not be tenderly treated, as they require only to be protected from hard frosts.

The fourth, fifth, and seventh species are easily propagated by their creeping roots, which if they remain undisturbed, will, in a short time, overspread the ground where they are suffered to grow; they may be transplanted either in the spring or autumn, and will thrive in almost any soil or situation.

The sixth species is propagated by seeds, which must be sown on a hot-bed in spring; when the plants are about three inches high they may be planted in pots, and treated in the same manner as directed for the first three sorts.

The eighth species is a perennial plant, and is propagated by parting the roots some time in autumn, and planting them in beds at the distance of two feet every way; they will thrive in almost any soil or situation, but will continue longest in dry land. The roots must be transplanted, and parted every other year, to keep the plants within compass.

TENDRIL, a part of a stalk, or rather a branch from the side of a stalk, placed opposite to the leaf, which curls and lays hold on any adjacent body, and thereby supports the stalk, as the vine, &c.

TERGIFOETOUS PLANTS, such as bear their seeds on the back sides of their leaves.

TERRACE or **TERRAS**, a walk or bank of earth raised in a garden to a due elevation for a prospect.

TETRACERA, a genus of plants of which there is only one species.

It is a native of La Vera Cruz, and many of the British islands in the West-Indies, where it rises with a woody stem to the height of fourteen feet. The branches are slender, and twine about any neighbouring support. The leaves are oblong, oval, rough on the surface, of a greyish colour on their upper sides, and brown on the under. The flowers grow in bunches at the ends of the branches.

Culture of the TETRACERA.

It is propagated by seeds, which should be obtained from the places where it grows naturally, and sown in pots filled with light earth, and plunged into a moderate hot-bed of tanners-bark; before winter the pots must be removed into the stove, and placed in the tan-bed, where they must remain till spring, when they should be taken out and plunged into a fresh hot-bed of tanners-bark. When the plants are come up and obtained some strength, they should be each planted in a separate small pot, filled with light earth, and again placed in a good hot-bed of tan, shading them from the sun till they have taken

taken new root; after which they must be treated in the same manner as other tender exotics, which require to be always kept in a tan-bed.

TETRAGONIA, a genus of plants ranged by Linnæus among the *polyandria tetragynia*, and of which there are three species. 1. *Tetragonia*, with linear leaves. 2. *Tetragonia*, with oval, entire leaves, and a shrubby trailing stalk. 3. *Tetragonia*, with oval leaves.

These plants are natives of the Cape of Good Hope. If the stalks of the first species are supported they rise four feet high, if not, they trail on the ground. The branches when young, are succulent, and covered with small pellucid drops, which reflect the light. The leaves are thick, narrow, blunt, placed alternate, and at their base appears a cluster of smaller leaves. The flowers grow at the wings of the stalk, and are succeeded by capsules, containing each one seed, which ripens in winter.

The second species resembles the first in every respect, except that the stalks and flowers are larger.

The third species has a very large root, soft, yellow, long, and hung with a few fibres. Many stalks grow from the head of this, which are round, tender, purplish or yellowish at the bottom, elsewhere green, and trail on the ground; the leaves are placed upon them singly and irregularly: they are small at the base, and gradually enlarge to a broad-rounded end: they are thick, juicy, and of a lively green. The flowers are very numerous, but small, and of a bright yellow.

Culture of the TETRAGONIA.

All these plants are propagated by cuttings, which should be laid to dry five or six days before they are planted. The best time for doing this is in July, and they should be planted on a bed of fresh earth, where they should be shaded from the sun in the heat of the day, and frequently refreshed with a little water. In about six weeks they will have made good roots, when they should be transplanted into pots filled with light, fresh, undunged earth, and placed in a shady situation till they have taken root: after which they may be set among other hardy exotics, where they may remain till the middle of October, at which time they should be removed into the green-house, and placed where they may enjoy as much free air as possible in mild weather. They should have very little water in winter.

These plants may also be propagated by seeds, which should be sown on a warm border of light, fresh earth, where they will often remain a year before the plants come up, for which reason the border should not be disturbed, but kept constantly clean from weeds. When the plants are about four inches high they should be taken up and planted in pots, after which they may be treated in the same manner as the cuttings.

TETRAPETALOUS, an epithet given to flowers that consist of four single petals, or flower leaves, placed around the pistil.

New-Jersey THEA, *Ceanothus*, a genus of plants ranged by Linnæus among the *pentandria monogynia*, and of which there are three species. 1. *New-Jersey Thea*, with three-ribbed leaves. 2. *New-Jersey Thea*, with leaves that have no nerves or ribs. 3. *New-Jersey Thea*, with spear-shaped leaves that have no ribs, and roundish stipulæ.

The first species is a native of North America. It is about four feet in height, and sends out a number of branches. The leaves are oval, pointed, having three longitudinal veins running from the foot-stalk to the point, and of a bright green. The flowers are white, and grow in thick spikes at the extremity of each shoot, so that the whole shrub is covered with them, which makes a most beautiful appearance.

The second species rises to the height of ten, and sometimes twelve feet. The leaves are oblong, pointed, smooth, slightly sawed on their edges, and of a lucid green. The flowers are small, and of an herbaceous colour.

The third species grows naturally in America. It rises to the height of twenty feet. The leaves are

oval, and veined. The flowers grow from the wings of the leaves, and are of a white herbaceous colour.

Culture of the New-Jersey THEA.

The first species is propagated by laying down the young branches, which will readily take root, and require no particular management. They will be fit to take off the next season: after which no more is necessary than to pot them, and, for perfect security, to take them into the green-house in winter.

The second species is propagated by seeds, which should be sown on a hot-bed in the spring. When the plants are fit to remove, let them each be planted in a separate small pot filled with light sandy earth, and plunged into a hot-bed of tanners-bark, observing to shade them till they have taken root. In the autumn they must be placed in the bark-stove, and watered with great caution.

The third species is propagated by cuttings, which should be planted in spring, in pots filled with kitchen-garden earth, and plunged into a very moderate hot-bed, where they must be shaded in the heat of the day, and at times refreshed with a little water. When they have taken root they must be gradually inured to the open air: and when they have got strength, separate, and plant them each in a small pot, and when they have got new root let them be treated like other tender exotics, housing them in autumn.

THERMOMETER, an instrument for measuring the increase and decrease of the heat and cold of the air, by means of the elastic and expansive power of bodies of the fluid sort.

Many different ways, methods, and forms of constructing such an useful instrument, have been thought of, and invented at several times for this purpose: at first air, then oil, then spirits of wine, and lastly, quicksilver, has been every way attempted in this experiment; the spring of air being sooner affected by heat and cold than that of any other fluid, was first thought upon as the best expedient to answer this end: and it really would be, were it not that the weight or pressure of the atmosphere affects it also at the same time; and by acting sometimes with, sometimes against it, renders the effect by heat and cold very uncertain, and therefore the instrument useless.

It was upon this account found necessary to have recourse to some other fluid, which, secured from the pressure of the air in a tube, hermetically sealed, might expand and contract solely by the heat and coldness of the air about it. And because most fluids are subject to freeze and thicken in great degrees of cold, it was soon considered that spirits of wine, a little tinged with cochineal, would best answer the purpose, and accordingly Thermometers were generally made therewith, and became of common use. Though the spirit of wine Thermometers would do very well to shew the comparative heat of the air, yet this was far short of the virtuoso's views, who wanted to explore the various and vastly different degrees of heat in other bodies, as boiling water, boiling oil, boiling metals, and even fire itself, and degrees of cold too beyond what the spirit Thermometers can shew: for spirits in a moderate degree of heat will burst the tube, and in an intense degree of cold will freeze.

It having been found by experiment that linseed-oil required four times the degree of heat to make it boil as water did, it was quickly substituted for philosophical uses. As the mercury very freely and uniformly expands itself from hard frost to the heat of summer, so mercurial Thermometers are contrived with a scale to include those extremes only, and the beginning of the divisions, or 0, is fixed to that altitude of the quicksilver, as is observed when water just begins to freeze, or snow to thaw: for which reason that is called the freezing point in the scale.

The late Dr. Hales considers the freezing point as one boundary to vegetation: viz. on the side of cold; and the other boundary he fixes to that degree of heat with which wax will begin to melt, because a greater degree of heat will, instead of collecting and assimilating the nutritive

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nutritive particles, dissipate them, even those which are most viscid and glutinous: and therefore the plant will rather fade than vegetate in such degrees of heat; this space the doctor divided into one hundred equal parts in his Thermometers, but his numbers expressed in those of the Standard-thermometer, are for several particulars mentioned by the doctor as follows: For myrtles, $4\frac{1}{2}$; oranges, $6\frac{1}{2}$; ficoides, $7\frac{1}{2}$; Indian-fig, $8\frac{1}{2}$; aloe, 10; cereus, 11; euphorbium, 12; piamento, $13\frac{1}{2}$; air under the glass of a hot-bed, 17; the hot-bed itself, 28. If the hot-bed exceeds the heat of 40, or thereabouts, it will scorch the plants and kill them. The heat of milk from the cow is 28, that of urine 29, and of blood in a fever nearly 40.

Blessed THISTLE, *Cnicus*, a genus of plants ranged by Linnæus among the *singenesia polygamia aequalis*, and of which there are five species. 1. Blessed Thistle with a diffused stalk, and sinuated, indented leaves, or the common *Carduus Benedictus*. 2. Blessed Thistle with an upright stalk, the lower leaves jagged, and the upper ones intire, and concave. 3. Blessed Thistle with winged, sinuated, prickly leaves, embracing a single stalk, and the flowers growing close to the stalks. 4. Blessed Thistle with winged leaves, and scaly, membranaceous cups. 5. Blessed Thistle with heart-shaped leaves, curled prickly foot-stalks embracing the stalks, and nodding flowers.

The first species is a native of Spain, and of the Islands of Chios and Lemnos. The second grows naturally in the northern parts of Europe. The third and fourth in Switzerland and Austria, and the fifth in Siberia.

Culture of the Blessed THISTLE.

The first species is propagated by seeds, which may be sown either in spring, or autumn, but autumn is the best; scatter them on a bed of common earth in a dry part of the garden; where the plants will live through the winter, and in the spring they should be transplanted in rows at a foot distance, and the plants nine inches asunder in the rows. If the season should prove dry, it will be necessary to water them at times till they have taken root, after which they will require no other culture, but to keep them clean from weeds.

All the other species are propagated either by seeds or by parting their roots, the best time for which is autumn. They only require to be kept clear from weeds.

Melon THISTLE. See the article **MELON-THISTLE**.

Globe THISTLE, *Echinops*, a genus of plants of which there are four species. 1. Greater Globe Thistle. 2. Smaller Globe Thistle. 3. Globe Thistle with a large head. 4. Globe Thistle with a small blue head.

The first species is a native of Italy and Spain; the second of France and Italy; the third of Spain and Portugal; and the fourth of Greece.

Culture of the Globe THISTLE.

The first and second species are easily propagated by seeds, which, if permitted to scatter, the plants will come up freely, when they may be transplanted to the places where they are designed to stand, after which they only require to be kept clean from weeds.

The seeds of the third species should be sown upon a border of light earth where the plants are to remain; they require no other management, than to be thinned where they grow too close.

The fourth species is easily propagated by its creeping roots, which should be planted in a dry soil, and a warm situation.

Torch THISTLE, *Cereus*, according to Linnæus a species of Cactus, but considered by other authors as a distinct genus, of which there are twelve different species, all of them natives of the warmer parts of America; where they are cultivated for their fruit, but in the English gardens they are preserved for the beauty of their flowers.

Culture of the Torch THISTLE.

All the kinds of this remarkable plant are propagated by cuttings in June or July, which should be laid three weeks in an airy place, to dry: They are then to be planted in small pots, filled with light sandy earth, with

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a mixture of lime rubbish, laying some stones at the bottoms of the pots to drain off the moisture. The pots are then to be placed in a gentle hot-bed of tanners bark, where they must be watered once a week. Toward the middle of August they must have air admitted to them by degrees, and at the end of September they should be removed into the stove, where they are to remain the winter, and should never be exposed to the open air, even in the midst of summer.

When the top of an old plant has been cut off, it always throws out several young shoots from its angles, which may all be easily propagated in the same manner; and as it always continues to do the same, there will be a continual supply even from one stock.

They may be brought in small pieces from the West Indies, packed up in straw, and will grow, when planted here, equally well as cuttings from our own plants.

THORN-APPLE. See the article **Thorn-APPLE**.

Lily THORN, *Catesbaa*, a genus of plants, of which there is only one species.

This plant is a native of the island of Providence, where it rises with a branching stem ten or twelve feet high. The leaves are small, resembling those of box. The flowers grow from the sides of the branches: they are near six inches long, and of a dull yellow.

Culture of the Lily THORN.

It is propagated by seeds, which must be procured from the country where it grows naturally, and sown in small pots filled with light sandy earth, and plunged into a moderate hot-bed of tanners-bark. If the nights prove cold, the glasses must be covered with mats every evening; and if the seeds were good, the plants will appear in about six weeks. In autumn the pots should be removed into the stove, and plunged into the tan-bed; and in spring the plants should be carefully taken up, and each planted in a separate small pot, filled with light, sandy earth, and plunged into a fresh hot-bed of tanners-bark. In hot weather they should have a large share of air admitted to them, but in autumn they must be placed in the stove, where they should constantly remain, and be treated in the same manner as other tender exotic plants.

Box THORN. See the article **Box THORN**.

Christ's THORN, *Paliurus*, according to Linnæus a species of Rhamnus, but considered by other botanists as a distinct genus.

This plant is a native of the east, and also of many parts of Europe. It rises with a shrubby stalk about ten feet high. The leaves are oval, and of a pale green. The flowers grow in clusters at the wings of the stalks, and are of an herbaceous yellow colour.

Culture of the Christ's THORN.

This shrub is propagated by seeds, which as they do not ripen in England, should be procured from the places in which they naturally grow, and sown as soon as possible after they arrive, in a bed of light earth. When the plants have gathered strength they should be transplanted in autumn, soon after the leaves decay, or the beginning of April, just before they begin to shoot, into a nursery; some mulch must be laid about their roots, and they should frequently be refreshed with water, until they have taken fresh root, after which they will require very little care.

Egyptian THORN, *Acacia*. See the article **ACACIA**.

Goat's THORN, *Tragacantha*, according to Linnæus a species of Astragalus, but considered as a distinct genus by other botanists, of which they enumerate four sorts. 1. Goat's Thorn, with oval, obtuse lobes to the leaves. 2. Goat's Thorn, with spear-shaped lobes. 3. Goat's Thorn, with spear-shaped, acute-pointed, woolly leaves. 4. Goat's Thorn, with very narrow, smooth leaves.

The first species is a native of France and Italy. The second of the islands of Minorca and Majorca. The third grows naturally in the Archipelago; and the fourth in Spain.

Culture of the Goat's THORN.

These plants may be propagated either by seeds or slips. If by seeds, they must be procured from the countries

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where they grow naturally, and sown, in April, on a bed of fresh earth. When the plants come up, they must be kept clean from weeds, and if the season proves dry, they should have a little water at times: when they are strong enough to remove, they should be transplanted into small pots, filled with fresh earth, and placed in the shade till they have taken root: after which they should be placed in an open situation, where they may remain till about the end of October, at which time they must be set under a common hot-bed frame to be protected from the frost, but should have plenty of free air admitted to them in mild weather.

When the plants have got strength by being preserved a year or two in this manner, let them be shaken out of the pots, and planted in a clean, dry soil, and a warm situation.

If they are propagated by slips, they should be planted in April on a moderate hot-bed, which should be shaded from the sun in the day, and from the cold in the night. The plants must be frequently but gently watered till they have taken root: after which they may be exposed to the open air, kept clean from weeds, and in dry weather gently refreshed with water. On this bed let the plants remain till the following spring, taking care if the winter be severe, to cover them with mats; and in April they may be transplanted either into pots filled with light, sandy earth, or into warm borders in a poor, dry, gravelly soil.

Burning THORNY PLANT. See *Burning Thorny PLANT*.

THRIFT, *Statice*, a genus of plants of which there are three species. 1. Thrift, with spear-shaped, linear leaves. 2. Thrift, with linear, awl-shaped leaves. 3. Thrift, with plain, linear leaves; or Sea Pink.

The first and second species grow naturally on most of the cold mountains in Europe: and the third in salt marshes in many parts of England.

Culture of the THRIFT.

These plants are propagated by parting their roots in autumn. All the care they require is to be kept clean from weeds, and to transplant and part their roots annually.

THROATWORT, *Trachelium*, a genus of plants ranged by Linnæus among the *pentandria monogynia*, and of which there is only one species.

This plant grows naturally in shady woods in many parts of Italy.

Culture of the THROATWORT.

It is propagated by seeds, which should be sown in autumn soon after they are ripe. When the plants come up let them be kept clean from weeds, and as soon as they have acquired strength, be transplanted on a border of light, undunged earth, with an east aspect, and placed in rows six inches apart, and the plants four inches distant in the rows, where they must be shaded from the sun till they have taken root, and in autumn be transplanted into the borders of the flower-garden, where they will flower the following summer.

If the seeds of these plants are scattered on old walls, the plants will readily come up, and shedding their seeds, will maintain themselves without any care.

THYME, *Thymus*, a genus of plants ranged by Linnæus among the *didynamia gymnospermia*, and of which there are eight species: but of these, two or three only are propagated in gardens; and as these require the same culture, it is not necessary to describe them.

Culture of the THYME.

It is propagated either by sowing the seeds or parting the roots, both which should be done in March. The seeds should be sown on a bed of light earth, and should not be buried too deep. When the plants come up they must be kept clear of weeds, and watered at times: and in June they must be thinned, leaving the plants about six inches asunder, after which they will grow very fast, and require no farther care.

If they are propagated by parting of the roots, they should be divided into as many slips as possible, and each planted at six or eight inches distance, on beds of light

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earth, watering and shading them till they have taken root.

Mastick THYME, a species of Savory. See the article **SAVORY**.

TICKSEED, *Coreopsis*, a genus of plants ranged by Linnæus among the *syngenesia polygamia frustranea*, and of which there are eight species. 1. Tickseed, with decomposed, winged, narrow leaves. 2. Tickseed, with trifoliate, intire leaves. 3. Tickseed, with trifoliate, wedge-shaped leaves. 4. Tickseed, with oval leaves, and the lower ones trifoliate. 5. Tickseed, with spear-shaped, intire leaves. 6. Tickseed, with narrow, intire leaves. 7. Tickseed, with spear-shaped, sawed, opposite leaves, embracing the stalks. 8. Tickseed, with spear-shaped, sawed, alternate leaves, and running foot-stalks.

The first, second, third, fourth, sixth, and eighth species are natives of Virginia. The fifth of Carolina; and the seventh grows naturally in ditches in most parts of Europe.

The sixth and seventh sorts are seldom admitted into gardens.

Culture of the TICKSEED.

The first, second, third, and eighth species are propagated by parting of their roots in autumn; they require a light, loamy soil, and a sunny exposure.

The fourth and fifth species are propagated by seeds, which should be sown upon a gentle hot-bed in the spring: and when the plants are fit to be removed, they should be planted each in a separate small pot, and plunged into a fresh hot-bed. In June let them be inured by degrees to the open air, and afterwards planted in a warm border.

ROAD-FLAX. See the article *Calf's-Snout*.

TOMENTUM, the downy matter which grows on the leaves of some plants.

TOOTHWORT; *Dentaria*, a genus of plants of which there are four species. 1. Toothwort, with sawed leaves. 2. Toothwort, with seven leaves. 3. Three-leaved Toothwort. 4. Toothwort, with rough leaves.

These plants grow naturally in the woods of Austria, and in the mountains in Italy.

Culture of the TOOTHWORT.

These plants are all propagated by seeds, or by parting of their roots. If by seeds, they should be sown soon after they are ripe, in a light soil and a shady situation. In spring the plants should be removed into a border of the same soil, after which they will require no further care.

If these plants are propagated by parting of the roots, it should be done in October, and they should be planted in a moist soil and a shady situation.

TOURNEFORTIA, a genus of plants of which there are eight species. 1. Tournefortia, with oval, spear-shaped leaves. 2. Tournefortia, with oval leaves growing upon foot-stalks. 3. Tournefortia, with oval, acute-pointed leaves. 4. Tournefortia, with hairy, heart-shaped leaves. 5. Tournefortia, with heart-shaped leaves, which are woolly on their under-side. 6. Tournefortia, with oval, rough leaves, growing upon foot-stalks. 7. Tournefortia, with oval, spear-shaped leaves, having acute points. 8. Tournefortia, with spear-shaped leaves sitting close to the stalk.

These plants are all natives of different parts of America.

Culture of the TOURNEFORTIA.

These plants are all propagated by seeds or cuttings. If by seeds, they must be procured from the countries where they grow naturally, and sown in small pots filled with light earth, and plunged into a hot-bed of tanners-bark; in autumn they must be removed into the stove, and placed in the tan-bed, where they should remain all the winter, and in spring they should be taken out and plunged into a fresh tan-bed, which will bring up the plants. When these are fit to remove, they must be each planted in a small pot, and placed in a tan-bed, where they must be shaded from the sun till they have taken

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taken new root : after which they must be treated like other tender plants from the same countries, which require to be constantly kept in the bark-stove.

The plants raised from cuttings must be treated in the same way.

TRANSPLANTATION of Trees. See the article **PLANTING**.

TRANSPORTATION of Plants. In sending plants from one country to another, great cautions are necessary. The plants sent from a hotter country to a colder, should be always put on board in the spring of the year, that the heat of the season may be advancing as they approach the colder climates : and on the contrary, those which are sent from a colder country to a hotter, should be sent in the beginning of winter. The best method of packing up plants for a voyage, if they be such as will not bear keeping out of the earth, is to have boxes with handles, filling them with earth, and planting the roots close together ; the plants should be set in these boxes three weeks before they are to be put on board : and in good weather they should be set upon the deck, and in bad removed or covered with a tarpaulin. If they are going from a hotter country to a colder one, they must have very little moisture ; if, on the contrary, they are going from a colder to a warmer, they may be allowed water more largely, and being shaded from the heat of the sun, they will come safe.

A great many plants, however, will live out of the earth a considerable while : as the sedums, euphorbiums, ficoides, and other succulent ones ; these need no other care than the packing them up with moss in a close box : and there should be a little hay put between them, to prevent them from wounding or bruising one another, and holes bored in the boxes to keep them from heating and putrefying. In this manner they will come safe from a voyage of four or five months.

Several trees will also come safe in the same manner, taking them up at a season when they have done growing, and packing them up with moss. Of this sort are oranges, olives, capers, jasmines, and pomegranate-trees. These, and many others, are annually brought over to us from Italy : and though they are three or four months in the passage, seldom miscarry. For the best methods of transporting seeds, see the article **SEED**.

TRAVELLER'S JOY, a species of Clematis. See the article **CLEMATIS**.

TREE, *Arbor*, the first and largest of the vegetable kind, consisting of a single trunk, out of which spring forth branches and leaves.

Standard-trees are such as naturally rise to a great height, and are not topped : for the choice of trees of this kind to be transplanted out of a nursery, Quintiney recommends us to such as are straight, six feet high at least, and five or six inches thick at bottom, and three or four at top : the bark pretty smooth and shining, as a token of their youth, and of the good soil they grew in.

Dwarf-trees are such as are kept low, and never suffered to have above half a foot of stem. See the article **DWARF**.

TREE OF LIFE, or **ARBOR VITÆ**, *Thuja*, a genus of plants ranged by Linnæus among the *monoecia monadelphica*, and of which there are only two species. 1. Tree of Life, with smooth cones, and obtuse scales ; or the common Arbor Vitæ. 2. Tree of Life, with rugged cones, and acute-pointed, reflexed scales ; or the China Arbor Vitæ.

The first species is a native of Canada, Siberia, and other northern countries. It rises upwards of forty feet in height, and branches out irregularly on every side. The leaves lie over each other like the scales of fish. The flowers grow from the sides of the young branches ; when the male flowers have shed their farina they drop off, but the female ones are succeeded by oblong cones.

The second species is a native of the northern parts of China, where it rises to a great height. The branches cross each other at right angles. The leaves are of a

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bright green, and the cones are of a beautiful grey colour.

Culture of the TREE of LIFE.

Both the sorts may be propagated either by seeds, layers, or cuttings. The cuttings should be planted in September, on a shady border, and in a loamy soil ; they should be chosen from shoots of the same year, with a small joint of the former year's wood at the bottom of each : let them be planted three or four inches deep, and the next autumn be transplanted into beds or nursery rows, to be trained up.

When these plants are propagated by layers, the young branches should be laid down in autumn, and taken up the autumn following, and transplanted in the same manner as those raised from cuttings.

But the largest and best trees are produced from seeds, which should be sown soon after they are ripe, in pots filled with soft, loamy earth, and plunged into the ground in an east border, where they may have the morning sun only, and the pots must always be kept clean from weeds. If the plants do not come up the same year, which often happens, the pots must be placed under a common hot-bed frame during winter, and in the spring the plants will appear ; these should not be too much exposed to the sun, and in the winter they must again be placed under a frame. The spring following they may be transplanted into beds, and treated in the same way as those propagated from cuttings.

TREE PRIMROSE. See the article *Tree PRIMROSE*.

Chaste-TREE. See the article **CHASTE-TREE**.

Wayfaring or Pliant Meally TREE, *Viburnum*, a genus of plants ranged by Linnæus among the *pentandria trigynia*, and of which there are eight species. 1. Meally-tree, with oval ; intire leaves, and branches hairy and glandulous on the under-side. 2. Meally-tree, with intire, spear-shaped, oval leaves. 3. Meally-tree, with roundish, sawed, crenated, and smooth leaves ; commonly called Black Haw. 4. Meally-tree, with oval, indented, sawed leaves. 5. Meally-tree, with heart-shaped, sawed, veined leaves, hairy underneath. 6. Meally-tree, with leaves divided into lobes, and smooth foot-stalks. 7. Meally-tree, with leaves divided into lobes, and glandulous foot-stalks ; called the Marsh Elder, or the Guelder Rose. 8. Meally-tree, with oval, sawed, smooth, acuminate leaves, and glandulous foot-stalks.

For an account of the two first species, see the article **LAURUSTINUS**.

The third, fourth, sixth, and eighth species are natives of North-America : and the fifth of different parts of Europe.

For the seventh species see the article *Guelder Rose*.

Culture of the Wayfaring or Pliant Meally TREE.

The third, fourth, and eighth species are generally propagated by cuttings or layers, which should be planted in autumn in a moist soil ; they require no particular care.

The fifth and sixth species are propagated by laying down their tender branches in autumn, which the succeeding autumn may be taken off the old plants, and treated in the manner directed for the Laurustinus. See **LAURUSTINUS**.

TREE GERMANDER. See the article *Tree GERMANDER*.

Bird's-foot TREFOIL. See **LOTUS**.

Snail TREFOIL. See the article *Snail TREFOIL*.

Base-tree TREFOIL, *Cytisus*. See the article **CYTISUS**.

Stinking Bean TREFOIL, *Anagyris*, a genus of plants ranged by Linnæus among the *decandria monogynia*, and of which there is only one species.

This is a shrubby plant which grows naturally in the mountainous parts of Italy, Sicily, and Spain.

Culture of the Stinking Bean TREFOIL.

It is best propagated by seeds, which should be procured from the countries where it is a native, and sown in dry weather, about the end of March, on a warm border:

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border of light earth. When the plants are come up, they should be kept clear from weeds, and, if the season proves dry, frequently watered.

If the succeeding winter should prove severe, they must be covered with mats during the continuance of the frost, but in mild weather let them be used to the open air, and in March following be transplanted into a nursery-bed in rows at a foot distance one from the other, observing, if the season should prove dry, to water them till they have taken root, after which, during the summer they will require no other care but to be kept clean from weeds.

The next winter the plants must be sheltered with some mats or pease-haulm, and some rotten tan spread over the surface of the ground. In two years time they will be fit to transplant to the places where they are designed to remain. The best time for removing them is March, before they begin to shoot; in doing this, great care must be taken not to injure their roots, and, if the weather should require it, they must be watered till they have taken fresh root.

TRICOSANTHES, a genus of plants ranged by Linnæus among the *monoecia syngenesia*, and of which there is only one species.

This plant is a native of China. It has a fibrous root, from which a number of stalks spread every way on the ground. The leaves are broad, deeply divided, rudely indented on the edges of those larger segments, fixed on long foot-stalks, and of a shining green. The flowers rise from the same joints with the leaves, supported on very long and slender pedicles; they are large, of a snow-white, and fringed with fine fibres. The fruit is long, slender, and often, but not always crooked; the colour is at first green, variegated with white, and spotted with a dusky purple, but afterwards purplish, and then yellowish intirely.

Culture of the TRICOSANTHES.

It is propagated by seeds, which should be sown in pots filled with the following compost:

Pare off the turf with three inches of the upper mould from a rich piece of pasture, and then take two barrows of the soil underneath: with this mix a barrow of dung from an old melon-bed, and the same quantity of earth from under a wood-pile: lay these together in autumn, and let them lie all winter, frequently turning the heap.

Early in spring fill two or three large pots with this earth, broke fine, and lay on the surface in each pot, half a dozen of the seeds: sift over them a little of the same mould, give them a gentle watering, and set the pots up to the rim in a bark-bed, shading them from the sun.

When the plants appear water them gently every night, and give them air in the middle of the day; and when you can distinguish which is the strongest plants, near the centre of each pot, pull all the others up, and either destroy or plant them in other pots, but they will never succeed equal to the unremoved ones.

As those left in the pots increase in size, they must be oftener watered and have more air: and after they have acquired as much strength as can be given them in the bed, they must be set out in the middle of a hot day, and refreshed at times with water; they may stand among the exotics as long as the weather is perfectly warm, but as they cannot bear cold, they must early be taken into shelter. About the end of summer they will flower, and the fruit will appear in autumn.

TRICOSTEMMA, a genus of plants of which there are only two species. 1. Tricostemma, with long stretched-out stamina. 2. Tricostemma, with shorter stamina.

The first species is a native of North-America, and the second of Virginia.

Culture of the TRICOSTEMMA.

Both species are propagated by seeds, which should be procured from the countries where they grow naturally, and sown in autumn in pots, which in winter should be placed under a garden-frame to shelter them from severe frost, but should be exposed to the open air at all times when the weather is mild.

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In the spring the plants will appear, and when they are fit to remove they should be planted on a bed of light earth, shading them from the sun till they have taken fresh root, after which they will only require to be kept clean from weeds.

TRIUMFETTA, a genus of plants of which there are two species. 1. Triumfetta, with three-pointed, sawed leaves. 2. Triumfetta, with oblong, oval leaves, bluntly sawed.

The first species is a native of the West-Indies. It rises with an upright stem seven feet high, dividing at the top into four or five branches. The leaves are nearly divided into three lobes, ending in acute points: they are covered with a brown down on their under-side, but their upper is of a yellowish green. Long spikes of small yellow flowers terminate the branches, and grow from the sides of the stalks in clusters.

The second species is a native of India. It seldom rises above three feet high, branching out toward the top into three or four slender branches. The leaves are entire, sawed on their edges, and end in acute points. The flowers terminate the stalks in small clusters, and are of a pale yellow colour.

Culture of the TRIUMFETTA.

These species are both propagated by seeds, which should be sown on a hot-bed early in the spring. When the plants have four or five leaves, they should be transplanted each into a separate pot, and plunged into a moderate hot-bed of tanners-bark, where they must be shaded from the sun till they have taken new root. During the summer the plants may remain in this hot-bed, but in autumn they must be removed into the stove, and plunged into the bark-bed, where they must be treated like other tender exotics.

TRUMPET-FLOWER, *Bignonia*. See the article BIGNONIA.

TUBEROSE, *Polianthes*, a genus of plants ranged by Linnæus among the *hexandria monogynia*, and of which there is only one species.

This plant is a native of India, and contains a variety with double flowers, and another with striped leaves.

Culture of the TUBEROSE.

This plant, and its varieties, are propagated by planting the off-sets upon a moderate hot-bed about the beginning of March, and covering the bed in cold weather with mats or straw, and giving it plenty of water in dry weather. In this bed let the roots remain till the leaves decay in autumn: and if there should happen any frost before that time, the beds should be covered to guard them from it. About the beginning of December let the roots be taken up, cleaned from the earth, and preserved in dry sand till the season for planting them again.

But the best method of obtaining fine flowers, is to purchase some of the roots which are annually brought from Italy, and plant them at three different times: viz. the first the beginning of March, the second the beginning of April, and the third the beginning of May.

The first planting must be on a moderate hot-bed, which should have good rich earth laid upon the dung, about eight inches deep: over it should be placed a frame; and when the bed is in a proper temperature of heat, the roots should be planted at about six inches distance from each other every way, observing not to bury the upper part of the root more than one inch in the ground. After they are planted they will require but little water till they begin to shoot; but after that they must have it in great plenty, especially if the weather is warm.

When the flower-stems begin to appear, a large share of free air should be admitted to the bed, and toward the beginning of May the frame may be quite taken off, and hoops fastened over the bed to support a covering of mats, which need never be drawn over but in the night, except the weather should prove very cold.

The beds for the second and third plantings will require a much less quantity of dung than that for the first. The second bed should be arched over with hoops, and covered with mats every night, and in
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bad weather ; but the last bed will require no covering.

The plants may remain in the beds till the flowers are near expanding, at which time they may be carefully taken up, preserving the earth to their roots, and planted in pots, placing them in the shade for five or six days to recover their removal. As these plants advance in height, there should be a stick put down in each pot, to which the stalks should be tied.

When the flowers of the double sort are fully formed and near opening, the pots should be placed in an airy glass-case, to secure them from the dews and rains, which by falling on them would prevent the flowers from ever coming to perfection.

TUBEROUS ROOTS, such as consist of an uniform, fleshy substance, and are of a roundish figure.

TUBULOUS PLANTS, such whose stems or flowers, are hollow like a pipe.

TULIP, *Tulipa*, a genus of plants ranged by Linnaeus among the *hexandria monogynia*, and of which there are only two species. 1. Tulip, with an erect flower, and oval, spear-shaped leaves. 2. Tulip, with a nodding flower, and narrow leaves.

The first species is a native of Cappadocia, and the second of Ethiopia : from these many beautiful varieties have been raised by culture.

The characters of a good Tulip are, that the stem should be strong and tall, the flower should consist of six petals, three within and three without, and the former should be larger than the latter : the bottom of the flower should be proportioned to the top, and the ends of the petals should be rounded : the petals, when opened, should neither turn inward nor bend outward, but stand erect ; and the whole flower should be of a middling size, neither too large nor too small : the stripes should all rise from the bottom of the flower : the chives also should not be yellow, but of a brown colour.

Tulips are generally divided into three classes, according to their times of flowering : viz. the early, the middling, and the late. As it will be impossible for us to give a particular description of every flower in this beautiful tribe, we shall confine ourselves to a few in each class. Among the early Tulips are the White purple-edged Tulip, the painted Amethystine Tulip, and the embroidered Tulip.

White Purple-edged TULIP. The root is a bulb of a roundish, oval figure. The leaves are large, broad, hollow, pointed, and of a greyish green. The stalk is ten inches in height, slender, round, and not very robust, but it supports the flowers erect from the bud. On the summit of the stalk stands the flower, of a middling size, and the petals pointed : the ground colour is of a pearly white, but round the edge of each petal is continued a broad list of elegant purple ; the rib in the midst of each petal has, towards its base, also a tinge of light purple, but this dies away as it advances upward.

This is the natural colouring of the flower, but culture enlarges its whole form, diversifies the white with more streaks of purple, rounds off the petals, and introduces other colours.

The flower is bell-shaped, having no cup : it is composed of six petals so arranged, that they form a hollow body, somewhat widening at the mouth.

Painted Amethystine TULIP. The root is bulbous, of an oblong shape, white within, and covered with a brown membrane. The leaves are large, broad, oblong, hollowed, waved at the edges, and of a pale greyish green. The stalk rises in the midst of these, and is firm and upright, fifteen inches high, of a pale green colour, dusted with a grey powder, and there are on it two or three leaves perfectly like those from the root, but smaller. At the top stands one flower, large and of a fine and true shape : the ground colour is a pearly grey, with a tinge of faint crimson diffused all over it, and the whole body inside and out, is beautifully variegated with a deeper tint, with some admixture of blueish ; this is disposed in stripes, streaks, and blotches, with a very pleasing irregularity. The stripes are broad, and

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beginning from the bottom of the flower, are continued to the top : and the blotches, which are oblong, waved, and clouded, lose themselves in the same manner, at a small space from their origin, which is principally at the edges of the petals, near the top.

Embroidered TULIP. The root is bulbous, short, fleshy, and swelling out at the bottom. The colour is brown, and the outside skin is often woolly. The leaves are long, but considerably broad, fleshy, of a fresh green, with a light tinge of blue. The stalk is fourteen inches high, round, tolerably upright, and a little downy : its colour is a pale green, and it is usually streaked with red. There are commonly three leaves on it, but this is not certain : they are of the same shape with those from the root, and are covered with a greyish dust. One beautiful colour terminates the stalk ; the ground colour is yellow, and on this is laid a vast deal of crimson : this is not thrown in blotches, as in many kinds, but spread out naturally in a kind of rays ; thus much is certain and invariable in this Tulip, but a great deal of accidental change is seen in it ; the yellow is sometimes as pale as lemon-peel, sometimes perfect gold : and though the red has always the same crimson tint, it varies in degree from very pale to very deep.

Among the middling class of Tulips are the changeable Tulip, the golden Tulip, the bleeding Tulip, the pearl and crimson Tulip, the Auriflame, or gold and scarlet Tulip, and the white and purple Tulip.

Changeable TULIP. The root is roundish, brown, and hung with thick fibres : firm in substance, and quite white within. The leaves are broad, waved at the edges, and sharp-pointed. The stalk is fifteen inches high, tolerably upright, firm, and greyish. The flower is of the largest kind, and painted with a very bold and beautiful variety. The colours are three : a fleshy crimson, a pearly white, and a very bright yellow ; these are laid on in an inexhaustible series of various forms, and from one variety make a thousand. In general the white is the body or ground colour, but the red covers the greater part of the flower : and the yellow is not blended with these, or laid on like them in every petal, but here and there touched lightly in clouds upon the edges. But the perfection of the flower depends upon the proportion of red : if there is not a great deal of this the whole is faint ; yet there must always be left space for the white and yellow, in both which the red may also shew itself in elegant streaks.

Golden TULIP. The root is oblong, covered with a black skin, and hung with a few slight fibres. The leaves are very long, broad, hollow, of a blueish green, and pointed. The stalk is a foot high, round, pale, slender, and not very firm : it seldom stands perfectly upright, unless supported. The flower is moderately large, and of a perfect gold colour, untinged with any other. Its duration is a valuable consideration : for it will out-last almost any other kind.

Bleeding TULIP. The root is large, round, firm, and covered with a dusky skin ; the fibres are numerous and long. The leaves are broad, waved at the edge, hollow, and of a pale, greyish green. The stalk is round, firm, upright, and eighteen inches high : thickest at the base, smaller to the top, and of a pale green. The flower is one of the largest of the Tulip kind, and very glowing in its colours ; these are only two, yellow and red, but they are very perfect in their kinds, and well disposed in the flower ; the yellow is paler than what is usually expressed by gold colour : the red is a deep crimson, or rather a blood-colour ; the yellow is the ground tint : the red is laid on in very delicate veins, and has the appearance of a fluid colour running down the flower : thence it obtained the name of bleeding Tulip. The streaks are dashed and broken in some places, but many of them are more distinct, and rise from the very bottom of the flower, breaking and sending out side dashes as they rise.

Pearl and Crimson TULIP. The root is oblong and large, covered with a blackish skin, and hung with a few slight fibres. The leaves are very large, broad, hollow,

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hollow, waved, pointed, and of a blue green, but often brown in the hollow part. The stalk is firm, but not very thick: of a pale green, upright, and fourteen inches high. The flower is very regular in shape, and in the manner of opening; the six petals are in two series, three within, three outward, and the three inner ones are longest, but not much so; the bottom of the flower is finely rounded, swelling in a due proportion to the height, and giving a free disposal to the petals, without throwing them asunder; the colours are only two, white and red: the white is the ground colour, and it is of that delicate kind called pearly white, having in it a tincture of greyish and blueish: the red is the most perfect crimson, and disposed in the flower with a very pleasing regularity: it is laid on in even stains on the edges of the petals, which die away as they are continued narrower toward the middle.

Auriflame or Gold and Scarlet TULIP. The root is very large, oblong, covered with a brown skin, and white within. The fibres are long, thick, and numerous. The leaves are very large, broad, waved, pointed, and of a fresh green. The stalk is fifteen inches high, round, not very thick, and generally bent by the weight of the flower. The size and colouring of the flower render it very conspicuous; the colours scarlet and gold, are disposed in long, broad, and irregular stains, and the petals throw themselves open as if to disclose them.

White and Purple TULIP. The root is large, and covered with a thick deep brown skin. The stalk is upright, and a foot and a half in height: thickest at the base, small toward the top, but firm throughout. The leaves are very broad and of a deep green, pointed at the ends, but less waved than many others. The flower is of a middling size, handsomely rounded at the base; the petals stand upright, neither bending in at the tops nor turning outward, and rounded at the ends: the ground colour is the most perfect white: and the purple, which forms the variegations, is laid on in fine, slender, and even streaks: they run to the base of the petals, and spread themselves in smaller portions over the whole flower.

Among the late class of Tulips are the cluster Tulip, the flaming Tulip, the double Tulip, and the pearl and purple Tulip.

Cluster TULIP. The root is very large and oblong, covered with a deep brown skin, and hung with many fibres. The leaves are numerous, broad, firm, greyish, waved at the edges, and pointed at the end: the larger lie on the ground, but there are several of the same form upon the stalk; this is two feet and a half high, round, firm, pale, divided toward the top into several branches, and covered with a greyish hoariness. The leaves are placed alternate on the stem, and at the top of every branch stands one vast flower; the form is that of other Tulips: the colour a dusky red, sometimes a deep yellow, with a violet, black, or dusky base, naturally terminated on each petal by a white line.

Flaming TULIP. The root is large, and covered with a blackish skin. The leaves are very broad, of a greyish green, waved at the edges, of a firm substance, and hollow. The stalk is thick and upright, a foot high, and of a pale colour; there are two or three leaves on it, like those from the root, and at the top a single flower: the ground colour is a pure snowy white: the variegations are red and yellow, and there are in the best flowers several gradations between the two colours, such as flame colour, orange, and saffron, beside the perfect red, and the pure yellow; in general the red lies in broad and deep veins down the petals, and the yellow forms a kind of embroidery down the edge.

Late Double TULIP. The root is bulbous, and moderately large. The leaves are broad, oblong, hollow, waved at the edges, and of a blueish green. The stalk is ten inches high and weak; the leaves on it resemble those from the root, and at its top stands a specious and beautiful flower: the ground is crimson, and the points and edges of the petals are usually white: often that colour is dispersed in wild stains over the rest

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of the flower, and sometimes it occupies the greater part of its surface; the inner petals are tinged in the same manner: their ground is a light crimson, but the white is finely laid on in long streaks, and often there runs between these a rib of flesh colour.

Pearl and Purple TULIP. The root is small, oblong, and covered with a chestnut-coloured skin. The leaves are broad and short, hollow, obtuse, not much waved at the edges, and of a blue green. The stalk is weak and slender: it is usually near a foot in length, but, unless supported, does not carry the flower erect; there are two or three leaves from it altogether, like those from the root, and at the top stands one elegant flower. The colours are a very delicate pearly white, and a fine purple: the white is the ground colour, and the purple is laid on in oblique streaks, from the central part of each petal to the edge, and in a few waved lines at the top; these are small, like threads, in the most perfect state of the flower, and lie so near one another, that at a very little distance, the distinction is lost between them and the white spaces, and they give an universal glow of purple to the flower.

Culture of the TULIPS.

The same method of culture is proper for all Tulips. The usual manner of propagating them is by parting the root, but the only way to obtain new flowers is from seed; in May therefore the gardener should look carefully over his bed of Tulips, and mark a certain number for seed, being cautious that they have all the characters which constitute a good flower, and which we have described in the beginning of this article; when he has fixed on a sufficient number, he must shade them from too much sun, which would dry up the dust upon the buttons, on whose good condition the perfection of the seeds depends. When the flowers begin to fade, all the stems which stand near those designed for seed, must be cut down, and the mould broke with a trowel every other day, half an inch deep, allowing at the same time gentle waterings. In this manner let them be managed till the seed-vessel has its full bigness, after which no more water must be given. The stalks will soon shew that no more nourishment is given them from the root; they may be then cut off, and laid to dry in an airy room, where a small shelf should be hung from the ceiling, covered with cartridge-paper, and secured by an edge of the same, half an inch high: on this lay the heads, and every three days turn them; thus let them lie till the third week in August: then let them be opened, and the seeds carefully shook out: scatter them over the shelf, where they must again be turned every three or four days till they are sown.

In the middle of September the gardener should fix upon a piece of ground that is open to the south-east, defended from the full noon-day sun, and naturally open to the north: but a reed-hedge should be placed on that quarter, on a hinge, so that it can be brought forward to shelter the spot in severe weather: let the mould be dug out of the border, and its place supplied with the following compost, which should always be made as soon as the flowers are marked for seed. Mix together two bushels of dry mould from under the turf in an upland pasture, five pecks of pond-mud, and three pecks of earth from under an old wood-pile.

The border being ready, scatter on the seeds moderately thick, sift over them a quarter of an inch of the same compost, and give them a gentle watering: after which lay a few light hawthorn-bushes over the border, and during winter the few weeds which rise on the bed must be carefully pulled up while they are young, observing also to bring the reed-hedge forward for shelter all the hard weather.

In spring let the reed-hedge be thrown open, the bushes taken off, and the ground carefully looked over and weeded once a week. The young plants will soon appear in great numbers; they will require frequent weeding, and must be watered once in three or four days, gently, with a fine-nosed pot. In weeding the utmost caution must be used: for the young plants have vastly

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the appearance of grafts, but they may always be distinguished by their bringing up the husk of the seed with them.

The first appearance of the plants will be at the latter end of March, and toward the middle of June the leaves will decay: then let the surface of the bed be raked, and half an inch of fresh compost sifted over it; thus the roots may remain till the same time the succeeding year, when they should be removed: and for this purpose a fresh parcel of the compost should be mixed in autumn, and lie all the winter; take out the mould from the border, with the roots, and fill it up with this fresh compost: then sift the mould that was taken out, to separate the roots, and, after having given the new border a gentle watering, plant them in it with care, at about three fingers breadth distance, and cover them with two inches of the same compost. The next year, at the same season, let the same operation be repeated; and thus they are to be managed for the four first years, and in all these transplantings the compost should be laid about five inches thick, and the bottom trod hard before it is put in; after the fourth year the quantity of compost must be four times as much as at first: the border much larger and deeper, and the roots must be planted at a full finger's length distance.

The fifth year some of them will probably flower: the sixth year the generality: and the seventh, or eighth, all. When they are in full bloom, some upright posts about four feet high should be placed on each side of the bed, at a moderate distance, and over these some hoops should be carried, to support a canvas, which should be drawn over them from eleven in the morning to four in the afternoon every day, when the sun is powerful. It must also be drawn when there are sharp winds, hasty showers, or severe nights.

The fine and perfect Tulips should never be suffered to ripen their seeds; therefore, as soon as the flowers decay, let the stalks be broke off, and take away the covering. In the middle of June the roots must be carefully taken out of the ground, cleaned, and the loose, ragged, outer skins pulled off: lay them upon a mat in an airy room, and when they are hardened, lay them in a place which is not moist, neither must it be too close.

The off-sets separated from the principal roots must be managed exactly in the same manner, and planted in autumn three weeks sooner than the large roots, in separate beds.

The general time of planting the fine Tulip roots, is in the beginning of October, but the early kinds should be put into the ground three weeks sooner; they must be allowed all means of defence, and it is best to plant them where there is the shelter of a warm wall: and if the weather should come in severe just as their buds rise, they must be covered: the surface of the mould should be stirred, and afterwards, if the season be dry, they must be allowed with due care a little water.

African TULIP. See the article *African TULIP*.

TULIP-TREE, *Liriodendrum*, a genus of plants ranged by Linnæus among the *polyandria polygynia*, and of which there is only one species. It is a native of North-America, where it grows to a great size. The young shoots are covered with a smooth bark. The leaves are divided into three lobes, the middle one being blunt and hollowed at the point, appearing as if it had been cut with scissars; the two side lobes are rounded, and end in blunt points: the upper surface is smooth, and of a lucid green, the under-side is of a pale green. The flowers grow at the end of the branches; they are composed of six petals, three without and three within, which form a sort of bell-shaped flower, from whence it obtained the name of Tulip; these petals are marked with green, yellow, and red spots, so make a fine appearance when the trees are well charged with flowers. The time of this tree's flowering is in July, and when the flowers drop, the germen swells and forms a kind of cone: but these do not ripen in England.

Culture of the TULIP-TREE.

It is propagated by seeds, which should be obtained in the cones from America. In spring they should be

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taken out of the cones, and sown in pots, filled with fresh light earth, which must be placed in a bark-bed, and covered with mats, and frequently refreshed with a little water. When the young plants appear, they should be placed, during summer, in a shady situation: and in winter they should be put into a frame, where they may have the benefit of the open air in mild weather, and be sheltered from the severity of frost.

In the spring following the plants should be transplanted into small pots, and taken the same care of for four years, as while they were in the seed-pots; after this they will be strong enough to transplant finally into the places where they are to remain: it should be on a light loamy soil near other trees, but not over-shaded by them.

There are some who raise them from layers, but they are two or three years before they take good root, and then never make such strait and regular trees.

Laurel-leaved TULIP-TREE, *Magnolia*, a genus of plants ranged by Linnæus among the *polyandria polygynia*, and of which he distinguishes no more than one species, with several varieties: all distinct species according to other botanists.

It is a native of Carolina and Virginia.

Culture of this TULIP-TREE.

It is propagated by seeds, which should be procured from the place of their natural growth, and sown as soon as possible after they are ripe, in pots; the pots should be plunged into a moderate hot-bed: when the plants come up, they should, in hot weather, be shaded from the sun with mats, and have air and water. In the winter season they should be secured from the frost; and when they have acquired strength, they may be planted in the open air, in a warm, sheltered situation.

TURKS-CAP, a species of Lily. See the article **LILY**.

TURNIP, *Rapa*, a species of the Cabbage or Brassica, is commonly propagated in the fields, and consists of the following varieties: The round Turnip, with the red or purple top, the yellow Turnip, the black-rooted Turnip, and the early Dutch Turnip.

Those commonly cultivated in our gardens for the use of the table, are the white and the purple-rooted Turnip. They thrive best in a dry sandy soil, that is not too rich: if it is, they are apt to grow sticky; they are always the best tasted when produced on fresh lands.

Culture of the TURNIP.

The common time of sowing them is from the beginning of July to the middle of August, but the gardeners about London sow them every month from March to August, that they may have a constant supply. The early Turneps always succeed best when sown on a moister ground than the others: for on a dry one they are often subject to great damage, and are sometimes destroyed by the fly.

TURNERA, a genus of plants of which there are only two species. 1. Turnera, with linear, spear-shaped, hairy leaves, which are obtusely indented and acute-pointed. 2. Turnera, with oval, spear-shaped leaves, which are sawed and rough.

These plants are both of them natives of the warm parts of America. The first rises with a shrubby stalk to the height of eight or ten feet, sending out branches on every side. The leaves are narrow, spear-shaped, and hairy, terminating in acute points, sawed on their edges, and, when rubbed, emit a disagreeable odour. The flowers grow from the foot-stalks of the leaves, to which they sit very close, having two large leafy appendages to their empalements; the flowers are of a pale yellow.

The second species has a shrubby stalk like the first, and rises to near the same height. The branches are slender. The leaves are oval, spear-shaped, rough on their upper side, and of a lucid green; their under-side has many strong veins, and is of a light colour: they are sawed on their edges, and have long foot-stalks. The flowers are larger, and of a brighter yellow than those of the former.

Culture of the TURNERA.

These plants are easily propagated by seeds, which should

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should be sown on a hot-bed early in the spring; and when the plants are come up two inches high, they should be transplanted into small pots, and plunged into a hot-bed of tanners-bark; observing to water and shade them till they have taken root: after which they must be treated as has been directed for other tender plants from the same countries.

When the plants are grown pretty large, they may be treated more hardily, by placing them in the dry stove, where, if they are kept in a moderate degree of heat, they will thrive and flower very well.

Those who would save the seeds of these plants, must watch them carefully, because when they are ripe, they soon scatter if they are not gathered.

TURNSOLE, *Heliotropium*. See the article **HELIO-TROPE**.

TURPENTINE-TREE, a species of *Pistacia*. See the article **PISTACIA**.

TUTSAN, a species of *St. Johnswort*. See the article **St. JOHNSWORT**.



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VALERIAN, *Valeriana*, a genus of plants ranged by Linnæus among the *triandria monogynia*, and of which he enumerates sixteen species: but some of these, growing naturally in England, and others in different parts of Europe, which are never admitted into gardens, we shall omit, and only describe the nine following.

1. Valerian, with flowers furnished with tails, one stamen, and spear-shaped, entire leaves; or red Valerian. 2. Valerian, with flowers furnished with one stamen, and wing-pointed leaves. 3. Valerian, with a ringent flower, furnished with two stamens, and oval, sessile leaves. 4. Valerian, with three stamens to the flowers, and all the leaves winged. 5. Valerian, with three stamens to the flowers, winged leaves to the stalks, and those at the root undivided; or garden Valerian. 6. Valerian, with three stamens to the flowers, and oblong, oval, blunt, entire leaves. 7. Valerian, with three stamens to the flowers, and heart-shaped, sawed leaves, growing on foot-stalks, and placed by threes at the top. 8. Valerian, with three stamens to the flowers, a stalk divided into pairs, and linear leaves; called Corn Salad, or Lambs Lettuce. 9. Valerian, with four equal stamens to the flowers, wing-pointed leaves, and seeds fastened by an oval husk.

The first species grows naturally upon stony places in France, Switzerland, and Italy, and has been long propagated in the English gardens for ornament. The second species is a native of Portugal. The third of America, Mauritania, Sicily, and Spain. The fourth of England. The fifth and sixth of the mountains of Switzerland. The seventh of the Pyrenean mountains. The eighth of England; and the ninth of Siberia.

Culture of the VALERIAN.

The first species is propagated by parting the roots in autumn, or by sowing the seeds, soon after they are ripe, in a shady border. When the plants are fit for removing, they should be transplanted into beds at about nine inches, or a foot asunder, observing to water them till they have taken new root; after which they must be kept clean from weeds, and in autumn they should be transplanted to the places where they are to remain.

The second species is propagated by sowing the seeds soon after they are ripe: and when the plants come up, they will only require to be watered in dry weather.

The third species is propagated by seeds, which should be sown in autumn, where the plants are to remain.

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When they come up, they must be kept free from weeds, which is all the culture they require.

The fourth, fifth, and sixth species are propagated by parting of the roots in spring or autumn; those of the two first sorts should be planted in beds of fresh dry earth, but the last requires a stony soil, and a cold situation. When the plants come up they must be watered, if the season requires it, and kept clean from weeds.

The seventh species is propagated by sowing the seeds, soon after they are ripe, upon a shady border. When the plants come up, they may be treated in the manner directed for the first sort.

For the eighth species, see the article *Lambs Lettuce*.

The ninth species is propagated by seeds, which should be sown where the plants are to remain, either in autumn, soon after they are ripe, or in the spring. When the plants come up let them be thinned where they grow too close, and kept clean from weeds.

Greek VALERIAN, or *Jacob's Ladder*, *Polemonium*, a genus of plants ranged by Linnæus among the *pentandria monogynia*, and of which there are three species. 1. Greek Valerian, with cups longer than the tube of the corolla. 2. Greek Valerian, with cups shorter than the tube of the corolla. 3. Greek Valerian, with the lower leaves hastated, and the upper ones lanceolated.

The first species is supposed to be a native of England, and the other two grow naturally in North-America.

Culture of the Greek VALERIAN.

All the three species are propagated either by sowing their seeds or by parting their roots. If by seeds, they should be sown in spring upon a bed of light earth. When the plants are come up, and have acquired some strength, they should be pricked out into another bed of the like earth, about four or five inches asunder, observing to shade and water them till they have taken new root; after which they must be kept clean from weeds, and about the beginning of October transplanted into the borders of the flower-garden.

If they are propagated by parting of the roots, it should be done in autumn; and when the plants come up, they must be treated in the manner directed for the seedlings.

VARIEGATION, the art of streaking or diversifying the leaves, &c. of plants and flowers with several colours.

Variegation is either natural or artificial. Of natural variegation there are four kinds; the first shewing itself in yellow spots here and there, in the leaves of plants called, by gardeners, the yellow blotch. The second kind, called the white blotch, marks the leaves with a great number of white spots, or stripes; the whitest lying next the surface of the leaves, usually accompanied with other marks of a greenish white, that lie deeper in the body of the leaves. The third, and most beautiful, is where the leaves are edged with white, being owing to some disorder or infection in the juices, which stains the natural complexion or verdure of the plant. The fourth kind is that called the yellow edge.

Artificial variegation is performed by inarching or inoculating a striped or variegated plant into a plain one of the same sort; as a variegated common jasmine into a plain, common Spanish, Brazil, or Indian jasmine. A single bud or eye, Mr. Bradley observes, being placed in the escutcheon of a distempered tree, where it can only receive nourishment from the vitiated juices, will become variegated proportionably to the nourishment it draws, and will partake more of the white and yellow juice, than if a branch should be inarched, the bud having nothing to nourish it but the juices of the plant it is inoculated on; whereas a cyon inarched is fed by the striped plant, and the healthful one.

As to the natural stripes or variegations, there are some particular circumstances to be observed.

1. That some plants only appear variegated or blotched in the spring and autumn, the stains disappearing as they gather strength: of this kind are rue, thyme, and marjoram.

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2. Some plants are continually blotched in the spongy part of their leaves: the sap-vessels, all the time, remaining of a healthful green: such as the alaternus, orange-mint, &c. which, being strengthened by rich manure, or being inarched in healthful plants, throw off the distemper.

3. In other plants, the disease is so rooted and inveterate, that it is propagated with the seeds: such as the arch-angel, water-betony, bank cress, borrag, striped celery, and sycamore; the sides of which produce striped plants.

VASCULIFEROUS PLANTS, such whose seeds are contained in vessels which are sometimes divided into cells.

VEGETABLE, a term applied to all plants considered as capable of growth, that is, all natural bodies which have parts organically formed for generation and accretion, but not sensation. See the article **PLANT**.

VEGETATION, the act whereby plants receive nourishment and grow.

The process of nature, in the vegetation of plants, is very accurately delivered by the excellent Malpighi, to the effect following: the egg, or seed of the plant being excluded out of the ovary, called pod, or husk, and requiring farther fostering and brooding, is committed to the earth; which having received it into her fertile bosom, not only does the office of incubation, by her own warm vapours and exhalation, joined with the heat of the sun; but by degrees, supplies what the seed requires for its further growth: as abounding every where with canals and sinuses, wherein the dew of rain-water, impregnated with fertile salts, glide, like the chyle and blood in the arteries, &c. of animals.

This moisture meeting with a new deposited seed, is percolated, or strained through the pores or pipes of the outer rind, or husk, corresponding to the secundines of the foetuses, on the inside whereof lies one or more, commonly two, thick seminal leaves, answering to the placenta in women, and to the cotyledons in brutes. These seed-leaves consist of a great number of little vesiculæ, or bladders, with a tube corresponding to the navel-string in animals. In these vesiculæ is received the moisture of the earth, strained through the rind of the seed; which makes a slight fermentation, with the proper juice before contained therein. This fermented liquor is conveyed by the umbilical vessel to the trunk of the little plant; and to the germ, or bud, which is contiguous thereto: upon which the vegetation and increase of the parts succeed.

Such is the procedure in the vegetation of plants; which the illustrious author exemplifies in a grain of wheat, as follows: The first day the grain is sown it grows a little turgid; and the secundine, or husk, gapes a little in several places: and the body of the plant, being continued by the umbilical vessel to a conglobated leaf (which is called the pulp or flesh of the seed, as is what constitutes the flower) swells; by which means, not only the gem or sprout (which is to be the future stem) opens, and waxes green, but the roots begin to bunch out; whence the placenta, or seed-leaf, becoming loose, gapes. The second day, the secundine, or husk, being broke through, the stem or top of the future straw, appears on the outside thereof, and grows upwards by degrees: in the mean time, the seed-leaf, guarding the roots, becomes turgid with its vesicula, and puts forth a white down. And the leaf being pulled away, you see the roots of the plant bare; the future buds, leaves, and the rest of the stalk lying hid. Between the roots and the ascending stem the trunk of the plant is knit, by the navel-knot to the flower-leaf, which is very moist, though it still retains its white colour and its natural taste.

The third day the pulp of the conglobated, or round leaf, becomes turgid with the juice which is received from the earth fermenting with its own. Thus the plant increasing in bigness, and its bud or stem becoming taller, from whitish turns greenish; the lateral roots also break forth greenish and pyramidal from the gaping sheath, which adheres chiefly to the plant; and the lower root grows longer and hairy, with

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many fibres shooting out of the same. Indeed there are hairy fibres hanging all along on all the roots, except on their tips; and these fibres are seen to wind about the saline particles of the soil; little lumps of earth, &c. like ivy; whence they grow curled. Above the lateral roots there now break out two other little ones.

The fourth day, the stem, mounting upwards, makes a right angle with the seminal leaf: the last roots put forth more; and the other three, growing larger, are clothed with more hairs, which straitly embrace the lumps of earth, and where they meet with any vacuity, unite into a kind of net-work. From this time forward the root pushes with more regularity downward, and the stalk upward, than before. There is, however, this great difference in their growth, that the stalk and the branches find no resistance to their shooting up, while the roots find a great deal to their shooting downward; by means of the solidity of the earth, whence the branches advance much faster and farther in their growth than the roots: and these last, often finding the resistance of a tough earth insurmountable, turn their course, and shoot almost horizontally.

VENUS'S COMB, or **SHEPHERD'S NEEDLE**. See the article **SHEPHERD'S NEEDLE**.

VENUS'S LOOKING-GLASS, a species of Campanula. See **CAMPANULA**.

VENUS NAVELWORT, a species of Hound's Tongue. See the article **HOUND'S TONGUE**.

VERBESINA, a genus of plants ranged by Linnæus among the *singenesia polygama superflua*, and of which there are ten species, but of these there are only four to be met with in our gardens. 1. Verbesina with alternate, waved, running and obtuse leaves. 2. Verbesina, with oval three-veined leaves, placed opposite upon footstalks, and with seeds furnished with three horns. 3. Verbesina with spear-shaped, sawed leaves, placed opposite. 4. Verbesina with opposite, spear-shaped, sawed leaves, and double, alternate, sessile flowers.

These plants are natives of both the Indies.

Culture of the VERBESINA.

All the four species are propagated by seeds, which should be sown upon a moderate hot-bed in the spring. When the plants have obtained strength enough to be removed, they must be transplanted on a fresh hot-bed, shading them from the sun till they have taken new root.

In June they may be taken up, and planted in a warm border, where they must be shaded, and watered till they have again taken root, after which they will require very little care.

VERVAIN, *Verbena*, a genus of plants ranged by Linnæus among the *diandria monogynia*, and of which there are fourteen species. 1. Vervain with two stamina to the flowers, and very long leafy spikes. 2. Vervain with two stamina to the flowers, and very long, fleshy spikes, almost naked. 3. Vervain with two stamina to the flowers, oval spikes, spear-shaped, sawed, plaited leaves, and a shrubby stalk. 4. Vervain with two stamina to the flowers, loose spikes, prismatic, truncated, bearded, and alternate cups, and oval, obtuse leaves. 5. Vervain with two stamina to the flowers, loose spikes; the cups of the fruit almost globular, prickly, and reflexed downward. 6. Vervain with two stamina to the flowers, roundish, erect cups, and echinated seeds. 7. Vervain with two stamina to the flowers, long spikes, bearded cups, and oval, sharply-sawed leaves. 8. Vervain with four stamina to the flowers, spikes growing in conical heads, sawed leaves, and a creeping stalk. 9. Vervain with four stamina to the flowers, spikes disposed in bunches, and spear-shaped leaves embracing the stalks. 10. Vervain with four stamina to the flowers, long, acute-pointed spikes, and spear-shaped leaves. 11. Vervain with four stamina to the flowers, slender spikes, growing in panicles, and undivided, sawed leaves, with footstalks. 12. Vervain with four stamina to the flowers, slender spikes, leaves with many jagged points, and numerous stalks. 13. Vervain with four stamina to the flowers, slender spikes, disposed in panicles, leaves with many pointed jags, and a

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single stalk. 14. Vervain with four stamina to the flowers, slender spikes, and double wing-pointed leaves.

The eight first species are natives of the West Indies. The ninth grows naturally in Buenos Ayres. The tenth, eleventh, and twelfth are natives of North-America. The thirteenth of this country, and the fourteenth of Spain.

Culture of the Vervain.

The eight first species are propagated by sowing the seeds upon a hot-bed early in the spring. When the plants are fit to be removed, they should each be transplanted into a separate small pot, and plunged into a fresh hot-bed, where they must be shaded with mats in the heat of the day, till they have taken fresh root.

When the annuals are grown too tall for the frames, they should be removed into a stove or good glass-case, and if there is the convenience of a bark-bed in the glass-case, some of them should be plunged into it.

The perennial sorts may be kept in a glass-case till autumn, allowing them a large share of air in warm weather. As they increase in size, they should be transplanted into larger pots. The seventh species is by far the most tender, and must be constantly kept in the bark-bed.

The ninth, tenth, eleventh, and twelfth species, are propagated by seeds, which should be sown in autumn, on a soft loamy soil; when the plants come up they require no other culture but to be kept clean from weeds, and to be allowed room to spread.

The thirteenth species is seldom admitted into gardens.

The fourteenth species is propagated by seeds, which should be sown in autumn. When the plants come up, they must be kept clean from weeds, and thinned where they rise too close.

Hatchet VETCH. See the article *Coronilla*.

Bitter VETCH, *Orobanchia*, a genus of plants ranged by Linnæus among the *diadelphica decandria*, and of which there are a number of species, but the four following are those most commonly propagated in gardens. 1. Bitter Vetch with leaves placed by couples close to the stalks, and with indented stipulæ. 2. Bitter Vetch with oval, oblong, winged leaves, roundish, moon-shaped, indented stipula, and a single stalk. 3. Bitter Vetch with oval, winged leaves, intire, half arrow pointed stipulæ, and a single stalk. 4. Bitter Vetch with a branching stalk, and leaves composed of six pair of oblong, oval lobes.

The first and second species are natives of Siberia, and the third and fourth grow naturally in the forests of Germany and Switzerland.

Culture of the Bitter Vetch.

All these plants may be propagated either by seeds or by parting of their roots. If by seeds they should be sown in autumn. When the plants come up, they should be kept clean from weeds and thinned where they grow too close, and in the next autumn they should be transplanted to the places where they are designed to remain.

If they are propagated by parting the roots, the proper time for it is autumn; and they should be planted in a loamy soil, and a shady situation.

Liquorice VETCH. See the article *Wild Liquorice*.

Chickling VETCH, *Lathyrus*, a genus of plants of which there are twenty species; but as few of these are admitted into gardens, and those which are, all require the same culture it is needless to describe them.

Culture of the Chickling Vetch.

All the species cultivated in gardens, are propagated by seeds, which may be sown either in spring or autumn, in the places where they are designed to remain. Those which are sown in autumn, should have a light soil and a warm situation; but those which are sown in the spring should have an open exposure, and the soil need not be attended to, for they thrive upon almost any. When the plants come up they should be carefully kept clean from weeds, and when they are grown two or three inches high, some sticks should be put down by them, to

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support them, otherwise they will trail on the ground.

Horseshoe VETCH, *Hippocrepis*, a genus of plants of which there are three species. 1. Horseshoe Vetch with single pods fitting close to the stalk. 2. Horseshoe Vetch with pods growing in clusters upon footstalks. 3. Horseshoe Vetch with pods growing in clusters, upon footstalks, one border of which has lobes.

The first species is a native of Italy and Spain. The second of England, and the third grows naturally in Germany, Italy, and the south of France.

Culture of the Horseshoe Vetch.

The three species are all propagated by seeds, which should be sown in autumn, where the plants are designed to remain; when they come up they must be kept clean from weeds, and thinned where they rise too close, which is all the culture they require.

Kidney VETCH. See the article *Ladies FINGER*.

VEXILLUM, or *STANDARD*. See the article *STANDARD*.

VINE, *Vitis*, a genus of plants ranged by Linnæus among the *pentandria monogynia*, and of which there are several different sorts, all of them requiring the same method of culture in the same climate.

Culture of the Vine.

This plant grows as happily in plains as upon hills, and thrives as well in a strong soil, as in that which is loose and open; also in land that is poor, as in that which is rich: and in a dry soil, as well as in that which is naturally moist.

Nevertheless, it is of great importance that the quality of the Vine be adapted to the condition of the country: for as Vines are not all of the same kind, neither is the culture the same in every soil and climate. It is not easy to say which is the best, experience teaching us that every country has its own: but reason will inform us that that sort of Vine is proper for the plain, which bears fogs and hoar frost without being hurt: and for a hill, that which can bear drought and wind; that we should plant in a rich and fertile soil, a slender Vine, which does not bear plenty of fruit; in a stiff soil, one that makes strong shoots, and is covered with plenty of leaves; that it is proper not to commit to a moist place a Vine which bears tender and large grapes; nor too dry a place, a Vine of a contrary quality.

The nature of the climate is of great consequence. Two sorts of Vines are fit for a cold and cloudy situation: viz. either one which is early, and ripens its fruit before the winter: or one of firm and hard grapes, which bloom in the midst of fogs, and afterwards mellow with the cold and hoar-frost, as other grapes do with warmth. Where wind and storms are frequent, the Vines must take deep root, and bear hard grapes; where the situation is warm, they may be of more tender and more fruitful kinds. Vines, whose grapes rot with rain and constant dews, should be planted in dry places; and those in moist, which are hurt by drought. If any Vines are planted in places subject to hail, it should be those which have large and strong leaves, because they will shelter the fruit. Where the sky is usually serene and fair, all sorts of Vines will grow: and those may be planted to advantage, whose grapes fall quickly off.

Could we have the quality of the soil, the situation of the place, and the state of the weather to our wishes; that soil should be preferred, which is neither too strong nor too loose, but rather inclining to loose: neither poor, nor exceeding rich, but rather fertile. The situation should neither be a plain nor steep, but yet on a rising ground: it should neither be wet nor dry, yet moderately moistened with dews: it should neither have springs on the surface, nor at some depth in the earth: and yet it should communicate to the Vines a moisture which is neither bitter nor salt. The state of the moisture may be known, by dissolving some of the earth in water.

The Vine does not prosper either in a frozen, or in a scorching climate, but it thrives best in a country that is rather warm than cold. It is hurt more by rain than dry weather: it delights in gentle and moderate gales, but is greatly damaged by storms.

It is an observation of long standing, that ground which has never been plowed, or had trees growing on it, is the best for a vineyard. All authors agree that an old vineyard is the worst of any for making a new plantation: because the earth is entangled with the roots of the old Vines matted together, poisoned by their decay, and quite exhausted by their long standing. Woodlands may be used, because the roots of common trees and shrubs are easily extirpated. Where there is no unplowed land, the next to be preferred is a corn field, free from trees, or where trees have not been planted thick.

The fitness of new ground: for the Vine may be judged of by the shoots of such as grow naturally in it: for if they make thriving shoots, which have not a ragged or stunted appearance, the Vine will flourish there. Stones which crumble, or rot, as it were, with the weather being broken, and laid to the roots of the Vines, retain a moisture, cool them, and by that means are exceeding fit for nourishing them. For the same reason, gravel, pebbles, and loose stones are approved of, provided they be mixed with rich mould; but if they are mixed with poor earth they are bad. Flints are likewise very friendly to Vines, if covered with a moderate depth of earth: because being cold, they retain the moisture, and prevent the roots being parched up in very hot weather. A chalky bottom is fit for the Vine; but clay, not excepting even that which approaches to marle, or potters clay, is very unfit, as is also coarse, hungry sand.

It may be established as a general rule, to plant vineyards in a cold country so as to face the south, and in a warm climate so as to face the east, unless they are subject to storms from that quarter, in which case it is better that they face the north; and in exceeding hot countries, such for example as Egypt, it will be best to expose them to the north.

Mr. Miller says, that the best soil for a vineyard in England, is that whose surface is a rich sandy loam, and not above a foot and a half, or two feet deep, lying upon gravel or chalk: either of which bottoms is equally good for Vines. If the soil is deep, or the bottom either a clay or strong loam, it is by no means proper for this purpose: for though the Vines may shoot vigorously, and produce a great quantity of grapes, yet we have not sun to ripen them sufficiently. If the soil is too deep, the roots of the Vine will run to too great a depth to receive the influences of the sun and air; whence the juices of their fruit will be crude.

According to him, our vineyards should be planted on the north-side of a river, upon an elevation inclined to the south, with a very gradual descent, that the superfluous moisture may be drained off; yet if the ground slopes too much, it is by no means proper for this purpose. Hills to the north, as they shelter the vineyard from cold, and reflect the heat, will be of great advantage; the country round about should be open and hilly, to preserve the air dry. The vineyard should be open to the east, that it may enjoy the morning sun, to dry up the superfluous moisture.

Dr. Beal in No. CXVI, of the Philosophical Transactions, after having mentioned some instances of the warmth arising from stones under ground, especially lime-stones, and some kinds of pebbles, is of opinion that many of our hills and rocks might be greatly improved: for it would be no hard task, says he, to shovel down the shallow and mossy turf from the steepest declivities into places, where it may have some receptacle or stay; and there to impregnate it, with the spade and compost for garden or vineyard.

The ground must first of all be cleared of the roots of trees or shrubs, or whatever else can be a hindrance to the diggers, or might afterwards press down the trenched earth by its weight, or by the treading of those employed in carrying it off. It is of great importance that the earth be kept extremely loose, even, if possible, without a foot touching it, in order that the mould being all equally stirred, may easily give way to the young tender roots, wherever they extend themselves, and instead of

obstructing them by its hardness, receive them into its nourishing bosom.

A plain or valley must be trenched two feet and a half deep, and a rising ground three. A steeper hill must be trenched four feet deep: for when the mould is turned down from a higher place, it can hardly be thrown up again to a sufficient depth, unless the trenches are made deeper. Besides, I never approve, says Columella, of planting a Vine less than two feet deep, even in a valley; for it is better not to plant it at all, than to leave its roots too near the surface suspended from the nourishing moisture, which lies low, except where springs rise near the surface; and there the ground should not be trenched above a foot and a half deep.

The trenches must be made equally deep all the way to the bottom, the sides being perpendicular, and the ground marked out by a line, which must be carried forward as the work proceeds, always at equal distances, till the whole ground is equally trenched. Where the bottom is of a binding nature, it is of great advantage to lay in the bottom of the trenches, small stones, or other rubbish, to carry off the water, which otherwise, stagnating there, would chill the tender roots. In order to do this the more effectually, the bottom of the trenches are made somewhat convex towards the middle, the better to convey the water to drains cut at the extremities of the vineyard.

If necessity forces to replant an old vineyard, all remains of the old Vines must be extirpated. The ground ought then to be dunged with old dung, if it can be had, if not with new, and trenched most carefully, picking out every remaining root, which should be collected and burnt. The trenched earth should then be covered with old dung, which does not breed weeds, or with fresh earth brought from among thickets. Columella advises particularly, to have a careful overseer to inspect the workmen, and to be watchful that they do not make baulks.

Mr. Miller, instead of trenching the ground as the ancients did, proposes giving it a summer fallow, plowing it as deep as the soil will admit of, and clearing it of roots, weeds, or whatever else can obstruct the growth of the plants.

Columella advises great care to be taken in the choice of the Vine from which the cuttings are taken, and is therefore against purchasing strange plants at a venture, which may come from a soil and climate different from that they are intended for, and may not be of the sort of Vine which is desired. A Vine cannot be said to be fruitful, because it bears many grapes; for this may arise from the largeness of the trunk, and the great number of bearing shoots, which may have but a single bunch on each. If several bunches of grapes are seen to hang from each shoot: if from each bud left the former year, shoots with fruit spring forth; if the shoots which spring out of the trunk of the Vine have some bunches; and if even the secondary shoots, or those which grow out of the present year's shoots, bear grapes; that Vine may undoubtedly be esteemed fruitful, and fit to afford cuttings. Whoever has this much at heart, will mark the Vines which have been the most fruitful, and have yielded the ripest and soundest grapes, with ochre and vinegar, that it may not be washed off by the rain. Nor is this to be done for one year only; but the Vines ought to be examined for three or more vintages, to know whether they preserve the same degree of fruitfulness: for then it will be certain, that the fruitfulness must be owing to the good quality of the Vine, and not to a favourable season. Whatever grapes come to their full maturity without being rotted or damaged, for several seasons running, will yield more, and higher flavoured wine, than any others.

It is not enough that the stock from which the cuttings are taken be fruitful, but they must also be taken from those parts of it which promise the greatest fruitfulness. Those which grow from the stem or old wood of the Vine, seldom bear fruit, or produce fruitful Vines. Those which grow from the summit of the Vine are reckoned too luxuriant to plant; and though the

number of clusters on them may promise fruitfulness, yet they should not be relied on; but rather those which grow out of the middle of the Vine, of which the wood is firmer than that of the former. This Columella calls the genital part of the Vine; and says, that, having followed reason as his guide, and also a long experience, he chooses from that fruitful part of the Vine, shoots which, bearing plenty of fruit already, promise fecundity for the time to come. He is not contented with single clusters, but chiefly approves of those which have the most numerous offspring; and adds, that the neglect of these rules has rendered many vineyards less fruitful, indeed some quite barren, when the cuttings have been very improperly chosen.

Some are of opinion, that the whole shoot, as it is taken from the stem, is fit for planting; and for that end, they cut it into pieces of five or six eyes, each of which they plant. Others, with more reason, think that no part of the shoot is fit for being formed into a cutting, but only that part of it which is next to the wood of the former year: for every bearing shoot abounds in fruit below the fifth or sixth eye. The rest either bears no fruit, or produces only slender twigs. The ancients, says Columella, always preserved some of the old wood to the cuttings: but experience has shewn that this is wrong; for whatever is left of the old wood soon roots, when it is moistened and covered with earth, and kills the tender roots next to it; and when this happens, the whole Vine shrivels, or is burnt up. Whatever remains of the old wood should therefore be cut off, where the shoot grows to it, that the shoot may be planted with its own small head. Mr. Miller differs here in opinion from Columella; for he directs, that the shoots should be cut from the old Vine, just below the place where they were produced, taking a knot, or piece of the two years old wood to each, which, says he, should be pruned smooth.

Were cuttings, thus chosen, taken from the Vines every time they are pruned, for several vintages, and carefully planted, vineyards might be raised, which would yield plenty of the most generous wines: nor need we grudge this delay; for when once we are assured of the fruitfulness of a Vine, it may be multiplied by engrafting. This, says Columella, you, Publius Silvinus, can witness: for, from one early Vine on your estate, I engrafted the stocks of two acres of vineyard in two years. How much therefore, may the Vine be multiplied from these two acres, seeing that these are the offspring of only one?

There are two ways of planting vineyards; viz. either with cuttings, or with Vines which have already taken root. These last are called quicksets. In the provinces, says Columella, they plant cuttings, for they will not be at the trouble of having nurseries. The expert husbandmen in Italy approve of this practice, because the quicksets are attended with several advantages. They are less apt to die; and by reason of the greater firmness of their wood, they sustain better the extremities of heat and cold, and other intemperatures of the weather: and the transplanting of them quickens their producing grapes. Cuttings may do in a loose yielding mould; but a strong heavy soil must have rooted Vines, or quicksets.

Mr. Miller prefers good cuttings to rooted Vines, for planting a vineyard; because the roots of Vines do not grow strong and woody as most sorts of trees do, but are long, slender, and pliable; and therefore, after they have been taken up, they seldom strike out any fibres from the weak roots: but these generally shrivel and die, and thereby rather retard, than help, the plants in their growth, by preventing the new fibres from pushing out.

This difference of opinion between Columella and Mr. Miller may be accounted for, from the different depths at which they direct the Vines to be planted: for were cuttings to be planted two feet and an half deep, no roots would shoot out from their lowest part; and if the rooted Vines were planted so superficially in Italy as Mr. Miller advises, they would be dried up by the sun.

Columella directs that the nursery be made, neither in a poor hungry soil, nor in an ousy wet one; yet where there is moisture enough; and in a middling rather than a rich soil; because, though cuttings take root soon, and make strong shoots in a rich soil; yet, when transplanted, they shrivel, and seldom recover. It is therefore the husbandman's interest, rather to transplant from a middling soil to a rich one, than from a rich to a poorer. From a poor soil to a rich soil, they will thrive apace. It is not advisable to make the nursery in very poor land, because many of the cuttings will then die, and the others will arrive but slowly at a state to bear being transplanted.

The nursery should be trenched to the depth of two feet and an half, and being formed into beds three feet wide, the cuttings are planted in them at about a foot distance from one another, every way. This may be done either in the spring or in autumn. The spring is best if the climate be cold, or subject to much rain; and the autumn, if the climate be warm, and the soil dry, or situated on the side of a hill.

The length of the cuttings should be regulated by the distance between their eyes: for when these are near one another, the cutting may be shorter, and when they are more distant, it should be longer. This length should not exceed a foot, nor should it be less than three fourths of a foot, lest, being planted on the surface of the earth, the cutting should perish with drought in the summer; and, on the other hand, because when a cutting planted too deep has taken root, it cannot be taken up without some difficulty. If the cuttings are planted on the side of a hill, their length may be about fifteen inches on ousy ground, they need not have above three eyes, which may reduce them to nine inches, but certainly to more than six. In these three eyes are not included the numerous eyes which usually are on the cutting, near the part where it is taken from the stem: besides those numerous eyes, there should be three others, with joints. The cuttings should be planted so deep, as that the uppermost eye may be level with the surface of the ground; because all the sap will then be employed in one single shoot, which will consequently be so much the stronger. They should be planted as soon as possible after they are cut off the Vine; and in doing this care should be taken to avoid a strong drying wind, or a scorching sun. It is therefore best to choose a calm day, or at least a day in which there is but little wind. The sun may be kept off by shades, or any covering. The nursery should afterwards be kept clear of weeds, and be frequently dug. Only one shoot should be reared, and that should be fastened to a stick or slender pole, to bear it off the earth. The rest should be carefully rubbed off; and this shoot should be pruned down to two eyes in the autumn. The strongest shoot from these eyes should be reared the next summer; and with this management the cuttings will be fit to transplant at the end of thirty or thirty-six months.

Vines are likewise propagated by layers. For this purpose, a trench is dug four feet every way, that the layer may not be hurt by other roots. A shoot of the last year is then laid down in it, in such manner as to make its end rise at the farther part of the trench. Four eyes are left on that part of the layer which goes to the bottom of the trench; and they are to put out roots. All the eyes between them and the stem should be rubbed off, to prevent the growth of useless shoots. Two, or at most three eyes are left on the farther end, which rises out of the earth, and all the rest, between them and those at the bottom of the trench, are rubbed off. The layer thus prepared soon takes deep root, and in the third year, it may be cut off from the mother Vine. When the shoot is not long enough to rise again out of the earth, Columella thought of the following method: The end of the shoot is brought to the bottom of the trench, and the four lower eyes, left for the roots to shoot from, are covered with earth, as before: but instead of the eyes at the extremity, as in the former way, the two eyes next the surface of the earth, of that part which come from the stem, are left to make shoots, which

which they readily do, and in the third year, the layer may be cut from the mother Vine, as in the other case. In order to encourage the roots to strike out, they need not be covered with the whole depth of earth the first year, unless it should become necessary before the winter, to keep the roots from being chilled by water which might gather in the trench.

The ground being thoroughly prepared, by trenching, harrowing, and clearing it of every thing that can be hurtful to the Vine, it is marked out, in order to be planted. The Romans planted their Vines five feet asunder in a poor soil, six feet asunder in a middling soil, and at the distance of seven feet from each other in a rich soil. Sometimes too they left a space of ten feet between them, that there might be sufficient room for the strong shoots to extend themselves.

They generally planted their vineyards in a quincunx form, for which they marked out the ground by stretching across it a line trimmed with bits of red cloth, or of some other conspicuous colour, at such distances from each other as it was intended to leave between the rows. A piece of reed was stuck into the earth at each spot indicated by the cloth, and this was repeated till the whole field was marked out in equal distances. The planter followed, and dug a hole at each alternate reed, two feet and an half deep in level ground, two feet and three quarters if it lay sloping, and three feet deep where the declivity was considerable. He then removed the quickets from the nursery, taking them up with great care, and transplanted them the very same minute, if that was possible. All their shoots were previously pruned off, except one, which was the soundest and firmest, and of that only two eyes were left above ground. If any of the roots were hurt in taking them up, though all possible care was used not to injure them, they were cut off, very smooth. If two plants were set in the same hole, a few stones, of about five pounds weight, were laid between them in the bottom of the hole, to prevent their roots from interweaving together. They were likewise of opinion, that these stones saved the roots from being chilled in the winter, or scorched by the heat of the dog-days in the summer. Mago advised to lay the husks and stones of grapes mixed with dung, in the holes, under the roots of the Vines, as a means of strengthening them, and of hastening the production of young roots. During the chilling wet of the winter, they gave a warmth; and in the summer, they afforded a nourishing moisture. Columella disapproved greatly of putting two Vines in the same hole, because their roots constantly mingled together, and formed a kind of net-work, which retained too much moisture in the winter, and, by robbing each other of nourishment, proved prejudicial to both. If the soil of the vineyard was poor, Mago directed that the holes should be filled up with rich earth brought from elsewhere. The ground should be a little moist when the Vines are planted, but it had better be dry, than mirey wet.

Mr. Miller orders that the ground, which he before directed to be fallowed, be again well plowed in March; and that after having laid its surface even, the rows should be marked out, from south-east to north-west, at the distance of ten feet from each other. He then crosses these rows at the distance of five or six feet, and thereby marks the spot where each plant is to be set. The rows will consequently be, in this case, ten feet asunder, and the distance between the Vines in each row will be five or six feet; nearer than which they ought never to be planted. If they are set in squares so near together as six feet, there cannot be room for a sufficient current of air to pass between them when their branches are extended on one side; and for want of that the damps in autumn will be detained among the Vines, to the great prejudice of their fruit. In places abroad, continues he, where they regard the quality of their wine more than the quantity, they never plant their vines at less than ten feet, row from row, and some allow twelve; and he confirms the justness of this rule by what happens to other fruits, which are never so well coloured, so early ripe, or so well flavoured, when in

close plantations, as when they are produced on trees where the air can circulate freely about them, and the rays of the sun have free access to the branches, whereby the juices are better prepared.

Preferring cuttings to layers, as well as to rooted Vines, he directs, that the cuttings be taken from the Vine in the autumn, and that their ends, being made smooth, they be laid in the ground, about two inches deep, the rest of the cutting being left at full length; only observing to cover them with dry litter, or peas haulm, in dry frosty weather. In moist weather, the covering should be taken off, lest it heat, and make the cuttings grow, which would greatly injure them. In April, which he reckons the best season for planting Vines in England, the cuttings should be taken out of the ground, and their upper parts cut off, so as to reduce them to about fourteen inches in length, according to the distance of the buds or eyes. He thinks it of great service to leave their tops on all the winter, because the air would otherwise penetrate the wounded part, and greatly injure the remaining eyes. The lower ends of the cuttings should be put in water, about three inches deep, setting them upright, for six or eight hours, before they are planted, in order to moisten them and open their pores: then, at the centre of every cross mark, before made, a hole should be dug with a spade, about a foot deep, and one strong cutting should be set, a little sloping, in each of these holes, which should afterwards be filled up immediately with earth pressed down gently to the cutting. This earth should be raised about three inches round each cutting, so as just to cover its upper eye or bud, to prevent the wind and sun from drying it; for only that upper bud will shoot when the plant is thus managed.

Mr. Miller justly blames his countrymen for planting their vineyards, in the few attempts that have been made of them in England, with such grapes as are the sweetest and best for eating; this being contrary to the general practice abroad, where the rough austere grapes, which are by no means palatable, but which are by experience found to afford a noble rich wine, are preferred. This is also agreeable to the constant practice of the makers of cyder, who observe, that the best eating apples yield but a poor juice, and that the rough sorts afford a strong vinous liquor. I believe, continues he, that it will be found true in all fruits, that where the natural heat of the sun ripens and prepares their juices, so as to render them palatable; whatever degree of heat these juices have more, either by fermentation, or from any other cause, will render them weaker, and less spirituous. Of this we have many instances in fruits: for if we transplant any of our summer or autumn fruits, which ripen perfectly in England without the assistance of art, into a climate a few degrees warmer, these fruits will be mealy and insipid. So likewise, if we bake or stew any of these fruits, they will be good for little, because they will lose all their spirit and flavour by the additional heat of the fire: and on the other hand, many fruits which are not even eatable whilst raw, are thereby much improved. Some of these, which have been transplanted into a warmer climate, have been so altered by the greater heat of the sun, as to excel the very finest of the fruits that are ripened in this country. The grape most likely to succeed in England, is the Auvernat, or true Burgundy grape, which thrives very well in several places north of Paris.

Columella advises every prudent husbandman to stock his vineyards with different sorts of vines, because the weather is not so equal in any year, but that it may be more hurtful to some, than to others. If, therefore, he plants but one kind of vine, and the weather happens to be prejudicial to it, he will be deprived of his whole vintage: but if he has vineyards of various sorts, some of them may escape, and yield him fruit. He recommends particularly, that each kind of vine be planted by itself; because otherwise one of the following inconveniences will ensue; viz. either he must gather his late grapes with those that are early ripe, which will cause an acidity in the wine; or if he waits till the late fruit

come to maturity, the early grapes will be rotten, or destroyed by birds or rain: for the distinguishing of each kind cannot be trusted to the gatherer's discretion. The flavour of the ripe grapes is hurt by the addition of the unripe; nor will the wine made of them both, mixed together, keep till it is old. When each sort is separate, the vine dresser will be able to prune and manage it in the most proper manner.

He cautions his readers strongly against the too prevailing opinion of those who imagine, that the chief care and trouble are at an end when the vineyard is planted. He observes, that the vine is a tender delicate shrub, which can very ill bear neglect, and which, when young, often destroys itself, by being permitted to run too much to wood, or to bear too great quantities of fruit. Most people are so intent on having much fruit, that they load the vine with too many bearing branches, without having any regard to future years, or to posterity; and then complain, that their vineyards do not answer their expectation, when they themselves have destroyed them, either through covetousness, negligence, or ignorance. When the vine has arrived at its full strength and maturity, it can better bear some neglect. Believe Silvinus, says this excellent husbandman to his friend, what I know from my own experience, that a vineyard judiciously planted with good vines, and well cultivated, never fails to bring its owner a most abundant return. This he confirms from Græcinus, by the example of Pavidius Veterensis, who had two daughters, and a farm planted with vines. He gave the eldest daughter one third of his farm, on her marriage, and yet had as much fruit from the remaining two thirds, as he had before from the whole. He afterwards gave half of the remainder to the younger daughter, on her marriage, and still had as good an income as at first. This, says Columella, must arise from the remaining thirds being proportionally better cultivated, than the whole had been before.

When the vineyard was perfectly well cultivated, and in a good soil, the Romans planted cuttings in the spaces between the vines, where they grew as in a nursery. The vines and cuttings soon throve and gathered strength, when the ground was kept in so loose a state by frequent digging, as to be reduced to powder, and always perfectly free from weeds, which would consume the nourishing moisture that should feed the plants, whose roots extended easily in such loose mould. It was a general rule, that the diggings should be repeated once a month, from the first of March to the first of October; and all weeds were carefully pulled up by hand, and carried off the ground, lest they should take root again. Mr. Miller says, that as the space between the rows of vines is great, the ground there may be sown or planted with any kind of esculent plants, provided they are kept at such distance from the vines, that these be not injured by them. This husbandry, which is also the method in France, may be continued three or four years, till the vines come to bearing: but after that, no sort of crop should be set between them in the summer; because, the clearer the ground is kept, the more heat will be reflected to the grapes. After they are gathered, a crop of coleworts, for spring use, may indeed be planted between the rows, and the stirring of the ground for them will be of great service to the vines.

From the time that the vine first begins to bud, all superfluous shoots must be carefully rubbed off, that the nourishment may be consumed by those only which are to be reared. Two shoots are generally set apart for growth; the one as a reserve, in case the other should fail. As soon as they rise, a prop should be set in the ground, for each of them. This prop should be slender, because the weak tendrils of the vine will then lay hold of it more easily than if it was thick. As the shoots grow up, they are tied to the props with a soft slack binding, till their tendrils have encircled them; and at less than four feet from the ground, sticks are fastened across the props, that the vines may extend laterally, and thereby be the less exposed to the force of winds. In nurseries, this cross stick, or rail, should not be above

a foot high, lest strong winds should tear the young plants out of the earth. When the shoots are grown nearly to their full height, their tops are broken off, to make them increase in thickness and strength, rather than run up in a needless length. The most thriving shoot, which is to be the leading wood branch, must be trained up strait, and kept clear of secondary shoots for three feet and a half from the ground: but such as grow above that height may be permitted to remain till the autumnal pruning; for if they are all rubbed off, new shoots will immediately spring out from other eyes, so that, perhaps, none may be left for the next year's buds. The shoots which are rubbed off from time to time should never be suffered to grow so strong, as not to be easily displaced with the finger; for the heat in summer hurts the vine greatly wherever it has been wounded with a knife. For this reason, if it should be absolutely necessary to use the knife, a piece of the shoot which is cut off should be left prominent from the stem, to stop the effect of the heat, which, in that case, will not proceed farther.

About the middle of October, or before the cold came on, the Romans *ablaqueated*, as they called it, the roots of their vines; that is, they laid them bare, so as to expose to view the upper small roots which the vine had put forth in the summer, and which should be cut off with a knife; for if these are suffered to grow large, the lower ones will decay, and the vine will then be nourished only by roots, which, extending themselves along the surface of the earth, or but little deeper, must be exposed to the inclemency of the winter's frost, and be liable to be parched by the drought and heat of the summer. Whatever roots appear within a foot and an half of the surface must therefore be cut off. The best way is to cut them about an inch from the stem, and to leave that stump prominent; for if they are cut close, either others will shoot out, or the water which stands in the hollow made round the root, being frozen, will destroy the stem to the very pith, where the scar is: but both these accidents are prevented, by cutting them off at a little distance from the stem. And now will appear a reason why the vines should stand upright in the ground: it is, that if they are inclined, they must be liable to be wounded when they are *ablaqueated*; for while the digger is intent on digging, and forming a hollow round the vine, he may inadvertently wound the vines which grow obliquely, or even cut them quite through. If the winter is mild, the roots may remain uncovered till March; but if the severity of the weather forbids this, the hollows should be filled up by the beginning of December. Where the winters are very severe, some dung, or, if it can be easily come at, pigeon's dung, or urine which has been kept a long while, should be laid to the roots before they are covered. The vines should be thus *ablaqueated* every winter, for the first five years: and after that, as the lower roots will then have got pretty sufficient strength, it need not be repeated above once in three years.

From these directions of Columella, we may assign a reason why Mr. Miller does not speak of *ablaqueating* the vine. Columella wrote for Italy, where the heat of the sun is very powerful, and dries the surface of the earth to a considerable depth. It was therefore necessary, in order to secure moisture for the roots, to plant and keep them deep in the earth: but as the degree of heat in England is much milder, as well as of shorter duration, and as the earth here is refreshed by much more frequent showers during the summer, Mr. Miller directs the vines to be planted much shallower, and finds that it is not necessary to *ablaqueate* them. He rather guards against their taking too deep root.

The Romans reared all their vines in one stem to some height above the ground; and therefore, as soon as they had finished *ablaqueating* them, they cut off the weakest of the two shoots, which they called the shoot of reserve, and pruned the remaining shoot to two eyes. Mr. Miller directs that both the shoots be cut down to two eyes, and that the earth be drawn up in a hill about each plant, which will be a great defence against frost.

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The wound should be made obliquely, almost in the middle between the joints, lest water should lodge in the pith, if the shoot were cut horizontally: but the slope must not be toward the eye, lest this should be hurt by the trickling down of the sap, or tears, which will ooze from the wound. Mago recommends the spring, as the fittest time for pruning the vine; because, being then full of sap, it affords an easy passage to the knife: but Columella does not approve of this, unless it be in countries where the winters are very severe: otherwise, he thinks the autumn the best season. The early writers on husbandry forbid touching the vine with the knife during the first year; and Columella, who likewise disapproves of it, making experience his guide, neither suffered his vines to become wild, by running too much to wood; nor did he, by cutting off the young shoots entirely, force them to shoot from the stem, which seldom proves so fruitful as shoots from the young wood.

During the second year's growth, the ground should be kept constantly stirred, as in the preceeding year, only with this difference, that it may be done once seldom. The weeds must be kept under, till the vines, by extending their branches, shade the ground, and thereby prevent their growing under them. All superfluous twigs must be constantly rubbed off as before, and only one shoot should be permitted to grow up, the props must be continued as in the former year. If any of the plants died in the first year, two shoots may be reared up on the strongest of the vines next the vacant space; one to form the standard shoot, and the other to be made a layer, to supply the place of the dead vine. After the vintage, this shoot must be laid down, or if it be not long enough to rise out of the earth on the other side of the hole, only its extremity need be put into the ground, as already directed. Next year, the layer must be cut half through, in the bend, that so it may not rob its mother too much, but be brought to be nourished by its own roots. When it is two years old, it may be cut off from the mother plant, and its root must be carefully ablaqueated, that it may strike the deeper into the earth. If the neighbouring vines cannot furnish layers, a rooted vine must be brought from the nursery; for it is too late to recruit a vineyard, when we should be gathering its fruit.

For the third year's growth, the vine must be supported with stronger and higher props than before. These should be fixed, either a foot from the vine, that they may not hurt the roots, and that so the vine-dresser may dig all round the vine; or in the middle between two vines. The first way is the best, because the vine and prop mutually support each other. If the prop is fixed near the vine, it should stand so as to shelter the vine, from the north. It is of great importance that the prop stand very firm. On each upright prop must be put a cross pole, sufficiently strong to bear the weight of the fruit. This year the vine may be permitted to make two shoots, to cover the cross pole on each side with bearing branches, unless the vine be yet too weak to nourish them. All superfluous shoots and twigs must be carefully rubbed off. The ground must be frequently stirred, to keep it loose, and destroy weeds. The roots must be laid bare in October. The places of dead plants must be supplied, as directed for the preceding year, and this must be a constant rule every year. When a vine dies after it has stood for some years, the hole or trench which is made for the layer or young plant, must be dug deeper and wider than it need to be after a young vine, in order that all the roots of the old one may be taken away. The trench should then be partly filled with fresh earth, or a good deal of dung mixed with the former soil. If each side of the vine has produced two shoots, and both of them shew plenty of fruit; yet one must be taken away, that the other may thrive the better, and bring its fruit to greater perfection.

When this vintage is finished, the vine may be pruned so as, in a fertile soil, where it thrives well, to leave three eyes, to produce bearing shoots for the next year; but four eyes should seldom be left. The binder must separate these shoots, and tie them to the frame,

to which another cross pole is now added, in the form of a star: or these cross poles may be supported by four props. The shoots spread in this manner become a counterpoise to each other. These cross frames are the more necessary if the vines are exposed to stormy winds, or if they stand on steep declivities, where every means of propping them is wanted. In warm and dry situations, the frame may be extended on all sides, in the form of an arched roof, the better to shade the thirsty earth: but in cold and frosty climates, the vines must be supported only on single frames or espaliers; for then the earth is more easily warmed by the sun, the fruit is more thoroughly ripened, and a freer passage is afforded to the air. The frames should not be lower than four feet, nor higher than seven. Young vines should be brought to this height gradually. The moister the soil and climate are, the higher should be the frame; for there, the thriving state of the vines admits of raising their branches, and their fruit being thereby raised higher from the earth, is the less liable to rot. In this situation, the winds blow freely through them, and dry up the dews and noxious fogs; the vines blossom more kindly, and yield a better wine. On the other hand, vines in a poor soil, on a steep declivity, and subject to scorching heat, require lower frames. If the vineyard is well placed, the best height is five feet; though there is no doubt but that the wine is the better flavoured, the higher the frames are.

If the vineyard is intersected by foot paths which divide it into a number of small partitions, the sun and wind have the freer access to the vines; as hath also the eye of the master, which is of great advantage. The labour too seems less to the vine dressers, when it is thus portioned out in small divisions. The paths afford convenient passage for the grape gatherers, for those who repair the frames, and for bringing in manures, or what else may be wanted. The owner can likewise distinguish the fruitfulness of each spot, and thereby be enabled to apply proper remedies. Where the rows of vines stand very far asunder, too much ground is generally left uncultivated between them; one half of which is commonly used for alleys, or foot-paths.

The trunk of the vine should be carried up strait to within a foot of the top of the frame; not only to conduce to its beauty, but also to its fruitfulness and duration: for the moisture which nourishes plants never has so free a motion through a crooked stem, as it has through a strait one; the bendings proving so many lets or hindrances to the equal circulation of the sap. The top of the vine should be fastened to the prop, so as to prevent its being bent, or dragged down, when it is loaded with fruit; and for greater security in this respect, the arms, or branches, which proceed from thence, should be trained along the frame, and tied to it, so that only those parts of the shoots on which the fruit grows may hang sloping down from the edge of the frame: nor should this be at right angles from the binding, because that position would endanger their breaking. When thus situated, they are less exposed to rain and hail, than when they are fastened to the frame. They should however be tied up before the grapes are ripe, to guard against their being rotted by the dew. When the vine is five years old, it will be sufficient to leave one fruit bearing shoot on each of its arms, or branches: but, some years after, when it has attained its full strength, a luxuriant vine, in a rich soil, may convey nourishment to eight fruit-bearing shoots; and, indeed, unless it be checked by a quantity of fruit, it will waste itself in wood and leaves: whereas a weak vine, in a poor soil, will soon be exhausted if it is burthened with fruit.

The branches of a vine should never be suffered to grow bigger than the stock: but, to supply their place, shoots issuing from their sides should be trained, and as soon as these begin to bear fruit, the old hard wood should be cut away. Fewer bearing shoots should be left on the branch which extends northward, than on that which is directed toward the south; because this last requires the greatest shelter from the scorching heat of the sun, and therefore stands most in need of leaves. All suckers must be cut away from the root, and the place whence

whence they sprung smoothed with a knife; for then it will soon skin over. No shoots must be suffered to grow from the trunk, nor should any knobs or warts be left on it. All dry, cracked, and shrivelled bark, must be taken off. Moss likewise, which shackles the vine, as with a fetter, and soaks it with its pernicious moisture, must be carefully scraped off: and if the trunk is any way damaged, or rendered hollow by rain or insects, it must be cut away to the sound wood. The wound should then be covered with earth which has been moistened with lees of oil for this will defend it from insects, sun, and rain, and therefore make it heal the sooner. All broad, ill-shaped withered sprays, and such as hang downward, commonly called dangles, must be cut off; and the strait shoots must be preserved. When the vine is freed from all these incumbrances, it will thrive the better, and yield the purer wine. The vine dresser should be particularly attentive, that all wounds in the solid wood be made sloping and round; because they afford the least lodgment to water, and are the soonest closed.

Sometimes a strong shoot strikes out of the fork of two of the leading branches, and cripples one of them. In this case, the crippled branch must be cut off, and the young shoot reared in its stead: but if it be taken in time, the young shoot should be cut off. Whatever grows out of the trunk of the vine must be cut away so smooth, that no water may lodge in the scar: but what grows on the young shoots of the same year, should be cut off between the two first eyes; lest by cutting it too near the main shoot, this also should be hurt by the wound, and the neighbouring bud be killed.

As to the length of the fruit-bearing shoots, there is no general rule; for it may depend greatly on the quality of the soil, and the vigour of the Vines, as well as on the distance between the eyes; for where the joints are shorter, a less length of shoot may be equally loaded with fruit. The last year's vintage should also be considered: for those parts of the Vine which then bore great plenty of fruit, must be spared in the following year; and such as produced but a small quantity, may be loaded the more. Most particular care should be taken, that every cutting instrument which touches a Vine, be sharp and well tempered; for otherwise, the labour of the vine-dresser is greater, and the Vine is rather torn than cut; so that there then remains an uneven scar, in which the juices putrify, so as often to kill the Vine.

Mr. Miller agrees with Columella in keeping the Vine clear of useless shoots, and in the frequent stirring of the ground: only, as the Vines in England are not planted so deep as in Italy, he cautions against digging too deep close to the Vines, lest their roots be cut or bruised. He differs somewhat in the method of propping and pruning, which he directs to be done as follows.

At the beginning of May, in their second year, when the Vines are shooting, two stakes, somewhat taller and stronger than those of the preceding year, should be fixed down to the side of each plant, and the two shoots should be fastened to them.

In the autumn, the Vines which have produced two strong shoots of equal vigour, must be cut down to three eyes each. When they have a strong shoot and a weak one, the strong shoot must be shortened to three eyes, and the weak one to two: and such as have but one strong shoot, should be shortened to two eyes.

In March of the third year, two stakes should be placed down by the side of all such Vines as have two shoots, at such distance on each side of the plant, that the shoots, fastened thereto, may form an angle of forty-five degrees with the stem: but they should not by any means be bent down horizontally, as some injudiciously advise and practise: for the branches, then lying too near the earth, are generally injured by the damps which arise from thence, especially if they have fruit, which is never so well tasted, nor so ripe, as when they are a little elevated. In May, the strong shoots should be fastened to the stakes.

If the two shoots of the former year have produced two strong branches, the uppermost of these shoots upon each branch should be shortened down to three good eyes, not

including the lower eye, which seldom produces any thing more than a weak dangling shoot; and the lower shoot should be shortened to two good eyes; these being designed to yield vigorous shoots for the next year, as the former are to bear fruit. Where the Vines are weak, and have not produced more than two or three shoots in the summer, but one of these should be left with three eyes, for bearing; the other must be shortened down to two, or if it be weak, to one good eye, in order to obtain strong shoots the following summer: for nothing is more injurious to young Vines, than leaving too much wood upon them, or over-bearing them.

In March of the fourth year, all small horizontal roots, which may have been produced near the surface of the ground, should be cut off close to the trunk. A stake should be placed about sixteen inches from the root, on each side of the Vine, and the bearing branches should be fastened thereto. Then another, and taller, stake should be thrust down near the foot of the Vine, and to this should be tied the two shoots which were pruned down to two eyes. In May, the shoots which shew fruit must be fastened to the stakes, with bafs, to prevent their being broken, until they are extended to three joints beyond the fruit; when they should be stopped, by nipping off the end: but the shoots, which are designed for bearing the next year, should be trained upright to the middle stake; by which method, neither of them shading the other, each will enjoy the benefit of the sun and air. The shoots should be constantly kept in their right position, to prevent the inverting of their leaves; for when that happens, it greatly retards the growth of the fruit.

Mr. Miller very justly censures the absurd practice of those who pull off from their Vines the leaves which grow near the fruit, in order to let in the ray of the sun, to ripen it; not considering how much they thereby expose their fruit to the cold dews which fall plentifully in autumn, and which, being imbibed by the fruit, greatly retard it: besides, no fruit will ripen so well when it is entirely exposed to the sun, as when it is moderately screened with leaves. By pulling off the leaves, which are absolutely necessary to prepare the juices before they enter the fruit, and of which juices the gross parts are perspired by them; the fruit must either be deprived of nourishment, or else, some of the gross particles will enter with the more refined parts of the juices, and thereby render the fruit worse than it would be if the leaves were left upon the branches.

This naturally leads me to another opinion, which I have long been inclined to entertain: it is, that not only the stripping the Vine of its leaves, but also the summer pruning, which is intended to hasten the ripening, and increase the goodness of the grapes, has the contrary effect. For in the spring, and while plants are in a growing state, their juices are of a watery acid nature, abounding in what the chemists call their native salt. As the summer advances, or as, respectively in each, their seed, or fruit, begins to ripen, their juices lose that watery acid state, and become gradually milder: and when the seed, or fruit, is come to full maturity, the juices of perennial plants become of an oily mucilaginous quality. This change in the nature of the juices of plants is gradual, and perfect, in proportion to the flourishing state of the plant. Now, if a considerable length is cut off from the young shoots of the Vine, while it is yet in its luxuriant growing state, and the motion of the sap is still brisk in it; a check must be given to nature in her juices. This is confirmed by the given effects of numbers of facts and experiments. As young shoots spring out again after this summer pruning, the juices are probably again brought to a thin watery state, in order to carry on that newly excited vegetation; the change of the juices into their milder and thicker state is thereby retarded, and consequently the richness and mellow ripeness of the fruit is impeded. It would therefore seem more advisable, to defer shortening the shoots, till they have nearly arrived at their full length, and the grapes are beginning to ripen. The perfecting of

of the fruit requires so strong an exertion of all the powers of nature, that few, if any, shoots will then spring out; by which means the buds for the next year will be preserved strong, and the grapes will arrive at a more perfect maturity.

Mr. Miller directs, that the vineyard, being now arrived at a bearing state, should be treated after the following manner. Too many branches should never be left upon a root, nor should those be too long: for although a management contrary to this may be productive of greater quantity of fruit, yet that fruit will not be so well nourished, nor will its juice be so good, as when it is but moderately plentiful: neither will the roots of the plants be so much weakened in this last case, as they must be in the former. The ground should be constantly kept clear of weeds; and no sort of plant should be suffered to grow on it, excepting that which it is intended to cultivate. It should be manured every third year, according to the nature of the soil. If the land is stiff, and inclinable to bind on the surface, sea-sand, or sea-coal ashes, are very good manure: but if it is loose and dry, a little lime mixed with dung will do it the most service. After each spring digging, the stakes are fixed as already mentioned, and the same care and management of the vines, as was before directed, must be continued. Mr. Arnoux says, that, in Burgundy, they bind the branches of the vine in an horizontal position, at the height of half a foot from the earth, to props three or four feet high, stuck into the ground, without any order, at the distance of about a foot asunder. They tie the shoots to these props as they extend in length, and find in this method the advantage that one branch is not shaded by another, but for as little a time as is possible.

Columella directs, that the props and frames be carefully examined after every pruning, and that whatever is amiss in them be repaired. Broad and flat props are preferable to round ones, and oak is the best wood they can be made of. Next to them, are round props of juniper, laurel, forest pine, and elder. Such as are rotten must be taken away, and new ones put in their stead. The bindings should be new every year. The ligature which fastens the stem to the prop should not be always in the same place, lest it should occasion a wound. The four branches should be tied gently to the cross poles, so as not to twist or bend them much. The shoots should be fastened so as that, when they grow beyond the frame, they may go shelving from it, and not hang by their binding, which would be apt to break them, especially when loaded with fruit. When two branches are so near together as to go to the same side of the frame, another pole should be placed between the cross ones, for one of those branches to be fastened to.

Those who are curious in gardening know what great things Dr. Agricola boasts of from the use of his mummies, in rearing the tenderest plants, as well as in raising forest trees from cuttings. The lees of oil, as Columella directs, mixed with fine earth, to give it consistence, may probably answer the same purposes. Where lees of oil cannot be had, some other bitter vegetable substance might be contrived, which, being free from the acrid oil in all turpentine (as in Agricola's mummies) might prove very friendly to plants, and be particularly useful in preventing their wounds from bleeding, and in preserving them from being scorched by the sun, or hurt by insects. It is necessary that this substance be bitter, that it may hinder the insects from preying on the tender juicy fibres, for instance, of the vine, wherever a wound is made. Even loam, by itself, is found to be serviceable for these purposes; and so is either goat's, sheep's, or cow's dung, well mixed with a due proportion of earth. The vine-dresser should therefore constantly have some such substance ready to apply to every wound he makes in the vine. Perhaps too, it may prove useful to the cuttings, when these are planted, by retaining the juices, till they are employed in their office of vegetation, and thereby help to save them from being parched up by drought, as well as to

render them less liable to be soaked in a wet soil, or by a rainy season.

Columella gives very particular directions for raising groves, in which trees grow till they are strong enough to become props for vines; as also for making nurseries of trees proper for supporting vines, or being married to them, as the ancients termed it. The plenty of wood in this kingdom, and the still greater abundance of it in America, renders that task unnecessary in this work.

He recommends the poplar as the most friendly tree to the vine, next the elm, and then the ash. As the poplar has fewer leaves, and these are not relished by cattle (which is an object of great importance in Italy, where grass is scarce) many reject it. The ash, whose leaves are agreeable to sheep and goats, is chiefly planted in rugged and mountainous places, where the elm does not thrive well. The elm is the most frequently planted, because it agrees exceedingly with the vine, and cattle are very fond of its cuttings.

When the trees are to be planted out, pits should be dug for them some weeks before they are removed. These pits should be made in a direction which may not interfere with the vine: as east and west, where it is necessary to plant the vine on the south side of the tree, because of the cold; or south and north, where the vine is to be set on the east or west-side of the tree. If the trees are planted in a field, where corn is to grow, and in a rich soil, the distance between them should be about forty feet: but in a poor soil, where nothing else is planted, twenty feet will be sufficient.

Whatever tree is planted for the purpose of supporting the vine, it should not be pruned for the first two years. If it be an elm, and grows but slowly, all its branches should be cut off excepting one, which should be the fairest and straightest that can be singled out. If it does not grow so upright as one would wish, some inches of the stump of another branch may be left near it, and by tying it thereto it may be trained up straight, in order to form the trunk of the tree. In the next year, the stump must be cut off and smoothed. If there is no branch fit for this purpose, the whole top must be cut off, at the height of nine feet, that cattle may not reach the young shoots. It should be cut with one stroke, if possible; otherwise it should be sawed off, afterwards smoothed, and then covered with loam mixed with straw, to preserve the wound from the sun and rain. In two or three years, when a new head is grown, the useless branches should be cut off, and the rest formed into the following order. In a strong soil, an elm should not have a branch within eight feet of the ground; nor within seven in a poor soil. At these heights, three branches should be left as equally distant as can be, in the circumference of the tree, to form what is called the first story. At three feet above them, three other branches are left, but not in the same line as the lower ones, if there be a possibility of avoiding it, because these would rub against the tender buds of the shoots of the vine hanging from the higher branches, and shake off the grapes. The tree is to be formed into stories, in this manner, up to the top. The branches are suffered to extend more or less wide as the soil is rich or poor, in order that the shoots of the vine may be spread accordingly. Care should be taken in lopping the elm, that the body of the tree be as little hurt as possible, and that the bark be not torn off, for this would do it great prejudice. The earth should be kept loose around the trees; and all suckers, or whatever else might shade the vine, should be cut away. When the tree grows old, and, either by a wound or otherwise, water lodges in it, a hole should be bored, or a channel cut, to give an outlet to the wet.

The vines should be planted before the trees are very strong. A young elm may bear a young vine, but it would be killed by an old one; wherefore their ages and strength should be proportioned. A trench must be dug for the vine, two feet and a half wide, three feet deep, five or six feet in length, and at least a foot and a half distant from the tree; for if it be planted nearer, the roots of the tree will not permit those of the vine to strike deep enough, and as

the tree grows, it will oppress the vine. For a vine that is to be planted in the spring, the trench should be dug in the preceding autumn; that the earth may be mellowed by the winter's rain and frost: and if it is to be set in the autumn, the holes should be laid open some weeks before, that the soil may have the benefit of the sun and rain. Though Columella had before found fault with putting two plants in the same hole; he here advises to put two in each trench, a foot asunder, that they may the sooner clothe the tree. A northerly wind, and cold dews, should be avoided at the time of setting them. If the climate is temperate, instead of having two plants in the same trench, a trench may be made on the east and another on the west-side of the tree, and a vine may be planted in each; by which means their roots will have sufficient room to extend in. Though Mr. Miller, as I observed before, thinks it of little consequence whether a tree that is transplanted be set to the same aspect as it had in the nursery: Columella recommends, as a circumstance which is attended with great advantage, particularly to vines (but he extends it to all trees which are removed from the place of their first growth) to mark them before they are taken up, in order that the same side may still be turned to the sun. In dry and warm situations, where neither a severe winter, nor a very wet one, need be feared, the autumn is the best season for planting both vines and trees; laying under their roots the depth of half a foot of the richest and finest mould, and covering them with well dunged earth. The vine should be planted in the trench with its stem inclining to the tree, against which it is to rise up strait; and it must also be defended from cattle. In hot countries, the vine should be planted on the north-side of the tree; in cold ones, on the south; and in temperate climates, either on the east or the west, that it may not be all the day in either the sun or the shade.

In the next autumn, the vines are pruned, as already directed, for frames. When they have reached the first story, shoots should be distributed to each branch, leaving a leading shoot, which is to go up to the top of the tree: and thus each story is gradually covered. It is a rule with many, to load chiefly the lower part of the tree, because there the vine bears most grapes, and they are most easily gathered: but those who regard the quality more than the quantity of their wine, clothe the upper branches most, and garnish the rest with bearing shoots in proportion to their strength. The future pruning consists in cutting off the shoots which bore fruit for the last vintage, and in rearing others in their place. If the vine is very thriving, the bearing shoots may be permitted to hang down sloping from the branch, to which their extremities should then be brought back, and tied: or if the vine is very luxuriant, they may be carried to the next tree. Though these shoots yield a great deal of fruit, they must be cut off at the next pruning, because, otherwise, they would weaken the vine too much. No shoots should be suffered to grow out of the firm wood, unless they are wanted in order to marry them to a widowed branch.

The young vine is tied to the tree at about four feet from the ground, and with this binding its growth may be checked, if it be too luxuriant, or if the tree has been deprived of its branches. It should be tied again at about half way up, and a third time at the top. The vines should be loosened every year, because they are then most easily pruned and cleared of all imperfections; and they are refreshed by being bound in new places. They are also then in less danger of being galled by the binding. The bearing shoots should be so laid on each branch, as that, being tied above the third eye, they may hang slanting down: but they must not be tied tight, lest the binding should cut them. At the same time that some shoots are thus laid for bearing fruit, others should be trained up to the body of the tree, to produce wood for the next year.

If the vine does not clothe the tree sufficiently, a shoot may be turned down to the ground at the autumn pruning, and made a layer, from which as many young

plants may be raised, as, being led up to the tree, will cover it enough. When the trees decay, young ones should be immediately planted in their stead; and when the vines begin to be worn out, they should be renewed by layers from neighbouring vines, rather than by quicksets.

To the foregoing directions for the cultivation of tall vines in Italy, and the same are equally applicable to all other warm countries, Columella adds the following account (which we shall likewise abridge from him) of the manner in which vineyards of lower growth were managed in the provinces of the Roman empire.

The husbandman there never trenched all the ground, but only opened a deep furrow, in which the vines were set. This might be sufficient where the soil was naturally loose. In some of these vineyards, the plants stood without any props; in others, they were fastened to rails; sometimes they were tied to dwarf trees; and sometimes they were suffered to run upon the ground. In the first of these cases, a single stem was reared up, free from side-shoots, till it had acquired strength enough to support the fruit bearing branches, which, when they were of a sufficient length, were bent down in a circular form, and tied to the lower part of the stem. In the second case, the fruit bearing shoots were trained to rails, or espaliers, as they grew. In both these ways, the planting, pruning, and other culture, differed so little from the general directions already given, that it would be needless to particularise them here; especially as I shall soon have occasion to speak pretty fully of the management of low and of middle sized vines, as now practised by the French, whose best vineyards consist of none else. As to letting them trail upon the ground, Columella justly thinks it so bad a method, that no excuse can possibly be offered for it, unless the country be indeed uncommonly subject to very high winds:—and then, perhaps, a doubt may arise, whether such a place be at all proper for the vine.

In Gaul, the trees for supporting the vines, besides being kept very low, were, of choice, such as had the fewest leaves. The poplar was therefore much esteemed for this purpose; for which the hornbeam, the mountain ash, and sometimes the willow, were also reared. The willow was planted only in moist places, where other trees could not thrive well; because it was thought to hurt the taste of the wine. The elm was likewise so managed, whilst young, as to be turned to a dwarf; as it may easily be. In dry and hilly situations, the stories of these trees were about eight feet high; and in vallies, or moist places, about twelve feet. These trees were generally divided into three branches, out of which several lesser boughs arose; and all the small twigs were usually cut off, at the time when the vine was pruned, to prevent their shading the fruit too much. If the dwarf trees were planted where corn grew, they were set twenty feet asunder in rows forty feet distant from each other: but when they were planted where there was no corn, their usual distance was twenty feet every way. Here the young shoots of the vines were more frequently carried from one tree to another, than when the trees grew high. If the trees were too far asunder to afford a support to the shoots, poles were extended between them, and these were up-held by props, as soon as the weight of the grapes began to be too heavy for them. In all other respects, the culture of the vine was the same as in Italy.

In clearing the vines of their superfluous shoots and leaves, Columella observes that, in the provinces, in places which were shaded, or where the sun had not much force, or which were moist and cold, the vine dressers used to strip the vines of many of their leaves, that the fruit might be the better ripened by the warmth of the sun, and not be rotted by too much moisture: but in places that were dry, warm, and exposed to the heat of the sun, the grapes were left covered with their leaves and twigs; and if the vine had but few shoots and leaves, the fruit was sheltered by some other covering: “Thus,” says he (in the passage before quoted), “my

"my uncle, Marcus Columella, a man skilled in all the liberal arts, and the most diligent farmer in Boetia, covered his vines with mats in the beginning of the dog days; because, during that season, the country was subject to a scorching easterly wind, which, like a fiery vapour, burnt up the grapes, if they were uncovered."

The authors of the *Maison Rustique* draw their precepts with regard to the method of cultivating vineyards in France, from the actual and most approved practice of Burgundy, Champagne, and Orleans, the wines of which countries are deservedly held in the highest estimation.

Their directions for the choice of the soil, its situation, aspect, the manner of planting it, and the future cultivation of the vine, are so like to those of Columella, that it would be needless to repeat them here.—They are, indeed, more explicit as to the grafting of the vine, which is performed in cleft, as for many sorts of fruit trees, but with this difference, that a smooth part of the vine, at the distance of about seven or eight inches from the stem, and between two joints, is the most eligible part for inserting the cion, which, as repeatedly said before in other similar cases should always be taken from the best bearing branch of the most fruitful vine. All small roots are cut away from about the place where the graft is to be inserted, and after it has been exactly fitted in the cleft, so as to make the inner bark of the cion coincide precisely with that of the stock, the wound is carefully bound up tight with slips of the inner bark of a young lime tree, of a willow, or with bafs, in such manner as effectually to preserve it from the entrance of air or wet. The graft and its stock are then bent gently downward into a hole made on purpose to receive them, and are covered with earth so as to leave only two eyes of the cion above ground. The cion should be used as soon as possible after it has been cut, and its length should be about twelve inches.

Neither the middle sized vines, nor the low ones, of which two sorts all the best and principal vineyards in France consist, should be shaded by any neighbouring buildings, or trees. The tall vines in the southern provinces of France, such as Provence and Languedoc, are, like those in Piedmont, Italy, and other very warm countries, reared up to trees, or formed into alcoves or arched walks, the better to defend them from the too scorching heat of the sun. The sorts thus planted are chiefly the Ciutat, the Corinth, the Damascus grape, and the Bourdelais. The vines about Auxerre are trained up against espaliers and trellises; but those of the lowest growth, of which most of the vineyards about Paris, Beaune, Tonnerre, Chablis, &c. consist, are fastened only to common props, and are generally found to produce the greatest quantity of fruit, and, in some years, the best wine.

The people of Champagne, (who think that there is in the soil of their province a quality so peculiarly fit for the production of fine wine, as can never be found or imitated elsewhere) plant their tallest vines in their middling lands, and the low ones in their best grounds. The former of these are reared to the height of four or five feet, and the latter to about three. They observe, that their vineyards yield the highest flavoured wine when they are most exposed to the sun; and therefore they always prefer a sloping situation, fully open to the south, for their best growths. They also prefer ground which is somewhat stony, and not naturally subject to much moisture. They manure this soil from time to time, by laying on dung and fresh earth; but with caution not to use too much dung, because that would render the wine flat and insipid, and apt to become ropy. They think cows dung better than that of horses, for their finest soils, because it is not so hot: but for stiff lands they use thoroughly rotted horse-dung, and sheep's dung, which they mix with about double the quantity of cow-dung, to prevent its burning the roots of the vines. Towards the end of autumn, they spread in trenches cut across the vineyard, layers of this dung and of fresh earth, and after this mixture has remained

there all the winter, to moulder, and grow mellow; they lay about half a basket full of it, early in the spring, to the roots of each vine, and particularly to those of the latest planted; making for that purpose a hole around it, deepest at its back, where the sloping ground is highest. This is done over the whole vineyard either every eighth or tenth year, or, which amounts to the same, to an eighth or a tenth part of it each year.

The grapes most generally cultivated in Champagne are a small black sort; and to render the wine of that country the more perfect, great care is taken to root out all white ones, and such as, though black, are large and coarse: or, if those vines are not pulled up, they are grafted with such fruit as is desired.

About the end of June, and sometimes even in May, according to the forwardness of the vine, the upper end of each shoot is nipped off, in order that the greater quantity of nourishment may be conveyed to the fruit; for it is best that no part of a low vine be more than two feet and an half, or three feet, high from the ground. These low vines are earthed, as it is called, every spring; that is to say, they are inclined down into a hole dug close to them, and their shoots, being previously pruned to such lengths as are most consistent with the vigour of the vine, are covered with earth so as to leave only three or four of their eyes above the ground.—In Upper Picardy, it is the custom to renew, as it is termed, the vineyards every year, by burying the vines in this manner, and converting each branch into a layer.

It is a general rule, that the stronger the soil is, the farther asunder the vines should be planted; and that no layers, grafts, or cuttings should be used, but such as have a smooth shining bark, and of which the wood is of a clear green when cut. Those that are of a brown green, when a little bit of their rind is raised up with a knife, are rejected, as good for nothing.

To guard against the bad effects of frosts and fogs, the French vine-dressers, whenever they apprehend any danger of that kind, lay along that side of the vineyard from whence the wind blows, a ridge of dry litter, or straw, which they then burn slowly: but if, notwithstanding this, the vines are frozen, they cut them down very low, to enable them to bear the better the next year.

They hold it to be necessary, after a thick fog, to water their vines with juice of the roots or leaves of wild cucumbers, or with powdered coloquintida, mixed with water; and they are also of opinion that late pruning is frequently a means of guarding against the mildew, because their vines do not then blossom till the sun is become very powerful.

Careful husbandmen never suffer any one to go into their vineyards very early in the morning when dews or damps fall in May, June, or September; because the dew of those months, being generally cold, would blister the leaves of the vines if it were to be touched, and thereby fixed upon them before the rising of the sun, which afterwards removes that danger by drying up and exhaling the moisture: neither do they allow them to be entered, on any account, immediately after a hasty spring-shower, while the leaves are yet wet therewith, or when they are covered with a rime or hoar-frost.

Sea-water, salt and water, or stale urine mixed with dung and earth, are of excellent service to vines which do not bear well, and to those whose leaves turn red for want of moisture: and it is said that, when their leaves become white and dry, when their wood swells, and when their fruit drops off, all which are symptoms of decay, they are recovered by rubbing the stem, and watering their roots, with ashes reduced to powder and mixed with strong vinegar.—It is most certain that stirring of the ground around them, and keeping it in a fine loose state, will have this desirable effect; or rather it will keep them constantly in so vigorous a condition, that there will never be occasion to recur to other means to promote their fertility: neither will there, if this essential principle of vegetation is duly applied to, be any danger of the grapes shrivelling, or growing dry upon the

the vine; to remedy which, if it should happen through careless management, the authors before quoted direct to pull off all the fruit thus injured, and to water the roots of the vine with stale urine. They add, that if the grapes rot upon the vine before they are ripe, some old ashes, or barley-meal, should be laid around the stem.

If the vines are sprinkled with water in which tanners have dressed their hides, no cattle will touch them.

The young leaves and fruit of the vine are often greatly injured by very small green flies, which conceal themselves in the young buds, and weave there a thin web, not unlike that of a spider, in which they deposit their eggs. All these webs, and the leaves on which the eggs have been laid, as well those which still adhere to the vine, as those which have fallen off, must be carefully collected, and burnt out of the vineyard.

As snails and slugs, which do great damage to the vines, generally hide themselves during the middle of the day, they should be carefully picked up early in the morning, or just after dew or a shower of rain has fallen, especially in the spring and autumn, which are the seasons when they appear most; and they should be crushed to death, or burnt.

The vine-fretters, which the French call gribouris, abound most in the lightest land. When a vine is attacked by these insects, its shoots are short and meagre, its leaves are full of holes, and it yields but very little fruit and that extremely poor, though never so great pains be taken to cultivate it. These insects are much smaller than the smallest gnats, which they resemble both in shape and colour. They prey upon the vine during the whole year; for, in September, they get into the ground, and there gnaw its roots, especially those of young plants; and in May when the buds of the vine swell, they leave their former holes feed upon the surface of those buds, and then upon the leaves, and afterwards they fix upon the grapes, pierce their skin, suck out their juice, and lay in them their eggs, from whence proceed an infinite number of little worms, which complete the destruction of the fruit by the time it should be gathered. To prevent this mischief, the authors of the *Maison Rustique* advise the sowing of a few patches of beans in different parts of the vineyard; because these pernicious insects will then resort to them, and may consequently be destroyed by plucking up the beans and burning them.

To get rid of numbers of other insects, all of which endeavour to find a place of shelter when the winter approaches, either by creeping into the ground, or into dung, or any litter that lies upon it; they recommend the method before-mentioned, of laying a little heap of halm, straw, or any kind of mulch, round the stem of each vine when the weather begins to be frosty, and burning it in the spring, in a place out of the vineyard. Innumerable multitudes of vermin will be destroyed by this means: but, to render the remedy effectual, the neighbours all around must have recourse to the same expedient, or these pernicious creatures will soon spread anew from one vineyard to another.

Mr. Miller's method of guarding against flies, and wasps, which are often so very numerous, and voracious, as entirely to eat up all the finest and highest flavoured berries of well ripened grapes, deserves much attention even in vineyards, though it is more easily practised in gardens; but the preventing of this mischief will make ample amends for yet greater trouble. It is, before the grapes are quite ripe, and consequently before they will be in much danger of being attacked by these enemies, to hang upon the vines, from space to space (the nearer the better), phials half filled with sugared water, and rubbed at the neck with a little honey. These will attract the wasps and flies, which, in attempting to get at the liquor, will fall into the phials, and be drowned. They must be carefully looked over every third or fourth day, to take out and destroy the flies and wasps, and to replenish them with liquor.

If, when the fruit is ripe, the stalks of the bunches are cut half through, about a fortnight before they are gathered, the juice of the grapes will be much improved thereby; because, as not near so great a quantity of nourishment can afterwards enter the fruit, the watery particles will have time to evaporate, and the juice will be the better digested. This is practised by some of the most curious husbandmen in the south of France. But if, after the bunches are cut off the vines, they are hung up in a dry room, upon strings, so as not to touch each other, for a month before they are pressed, both the strength and the flavour of the wine will be yet more exalted. To this, in a great measure, is owing the delicious richness of the vines of that part of the *Tirolese* which borders on Italy, where it is the constant custom to keep the grapes for some time before they are used.

When a vineyard is planted in a strong soil, it should consist of morillons, otherwise called white and black pineaus; but there should be more of the latter than of the former, and they should be intermixed with tresseaus, otherwise called Burgundy grapes.

The pineau does not attain to its full perfection in strong lands, though the season be never so hot: for, notwithstanding all the help that can be given it in such a soil, it still wants that undefinable somewhat, without which no grape can yield a delicate wine: whether it be, that, in imbibing its nourishment from the earth, its juices retain a portion of the moisture which is natural to that earth, and which blunts the spirits of the wine; or that, as experience has shewn in very many cases, though the heat be as great as possible, a strong soil does not yield to the grape that sort of juice which acquires a fine high flavour, and a racy vinous quality, by fermentation. Thus, it is known from facts, that the *Madeira* grape planted in a rich valley, no longer yields the same wine it does on its native rock. Yet the pineau is the only grape that should be planted in a strong land; because it ripens earlier than others, and always yields a sure crop.

If some plants of the tresseau, whose fruit never ripens easily, are mixed with the pineaus, it is, says the authors of the *Maison Rustique*, because our forefathers having found by experience that the pineaus cannot of themselves yield, in such a soil, wine which has a sufficient body to keep long, judged it necessary to add these tresseaus, which, though they ripen very slowly, never fail to yield that sort of wine which, without being spirituous, is, on the contrary, thick and heavy, which is the state it should be in when produced by strong land, in order to its becoming good.

In a sandy soil, whether it be coarse or light, pineaus, and especially the white sort, are the vines most proper planting. The meunier, or miller grape, delights in light sands; and coarse sands agree with the meliés, otherwise called melon grapes, whether these be white, black, or green. In the district of Auxerre, these sands, though naturally warmer than the strongest land, do not, for all that, yield equally good wine: (these strong lands are here supposed to be such as were before advised, and their exposition good.) This is what experience teaches us daily with regard to sands, which, furnishing no rich nutriment to the vine, yields only grapes whose juice is flat and insipid, and not so sugary as those of strong lands.

To these pineaus are therefore joined the meliés, as before said. The white melié is a good grape, and yields greatly; the black is less so. These sorts of grapes become excellent (so far as their nature permits) in these sands, which, being much warmer than they are substantial, suit the nature of the meliés, which require a great heat to ripen them. These grapes yield a wine which is not apt to turn yellow.

Upwards of two thirds of the vines planted in such sands, in France, are those of white grapes; because it is the custom of those places to make more white wine than red.

A reasonable proportion of the tresseau grape should always be planted with the others in sandy soils: not that

that it ever attains to perfection there; but that, by mixing it with those other grapes, whose juice acquires only a moderate sweetness in such ground, they may be enabled to yield wine which has a good body.

As to stony lands, ~~those~~ which abound in blackish and large stones, and of which the earth is reddish and somewhat moist, ~~must~~ be treated in the same manner as strong soils.

Those which have smaller and white stones, and of which the earth is less red, are better than the former. Besides the white and the black pineaus, and a small number of tresseaus, these lands are planted with the beaunier; and all these grapes do well on them.

Stony land whose soil is yellowish, and where the stones are yet much less than the preceding, are still better than them for the last mentioned sort of grapes: for these do so well in a soil of this kind, that they always yield there a wine which is at least pleasant. They may be intermixed here with a few plants of muscats and of chasselas: for these will acquire maturity enough to be of service to the others, and will help to make their wine keep the longer.

Stony lands which have otherwise a mellow and good soil, yield the best and finest flavoured wine when they are planted with pineaus; and in this case the number of the white grapes of this species should greatly exceed that of the black. Those from which the greyish wine, commonly called partridge's eye, is desired, should be planted chiefly with serviniens, and here and there a few muscats and chasselas; but no tresseaus.

When such lands as these are intended for red wines, they should be planted with more black pineaus than white, with some serviniens, and with a few tresseaus. These will yield a strong and mellow wine.

EXPERIMENTS ON THE CULTURE OF THE VINE.

Extract of a Letter from M. Roussel in Brie, to M. Du Hamel, written in the year 1755.

"I have begun to try the New Husbandry upon the vine. It is hard to pay at least one hundred and twenty livres (five guineas) a year, for dressing an arpent (about an acre and one fifth) of vineyard, to have only our poor Brie wine; especially when the vines are entirely frozen, as they were last year, or laid bare to the very wood, by hail, as was the case in August last. I am therefore trying to find out a way to manage vines, without being at the expence of dressing, or propping them, and by which they may be less exposed to the injuries of the weather, and less liable to be plundered by thieves. To this end, I pitched upon a spot of ground, about half an arpent in extent, which had formerly been a vineyard, but was grubbed up many years ago. I planted on it four hundred poplars, six feet asunder, in a quincunx form. As the roots of this tree are few and small, I thought that distance might be sufficient. At the foot of each of these trees, I planted two vine cuttings, one on each side. The alleys are plowed, in order to their being sown alternately, with corn, or pulse, such as lentils, beans, barley, oats, &c. the produce of which pays the expence of plowing. While the three feet on one side of the tree are sown, the three feet on the other side are plowed, at proper times and seasons; by which means, both sides of the tree, and consequently both the vines, receive in turns the benefit of the stirring of the ground. All my plants have taken well. I intend to let the vines run up the trees, without doing any thing to them; and shall wait with patience the event of their produce, which, be it more or less, will be so much clear gain, as it will not have cost me any thing. This method was immediately approved of by the country people hereabouts, several of whom are now following my example. What helped to give them this good opinion of it, so suddenly, was, the example of a vine, which chanced to grow a league from hence, in the middle of a field, at the foot of a pear-tree, and which never is either pruned or cultivated. Last year, when all the vines of this country were so damaged by the frost, as not to produce any fruit at all;

this vine escaped unhurt, and bore as many grapes as yielded a barrel of wine. If the future produce of my vineyard, which contains eight hundred vines, were to be estimated on this footing, it would amount to eight hundred barrels of wine every year. But as no one can be so absurd as to make such a calculation; so, on the other hand, I believe none will deny but that my vines, producing only the two hundredth part of that proportion, will yield me four barrels of wine, which will not have flood me in the least extraordinary charge. And even supposing them not to yield me any thing, still I shall lose nothing, because they will have cost me nothing. The four hundred poplars, which do not stand me in above a penny a-piece, (being planted only by slips, without making or digging either holes or trenches for them) cannot fail, in a soil that is quite fit for them, to be worth, twenty-five years hence, ten livres (eight shillings and nine-pence) apiece (or four thousand livres (one hundred seventy-five pounds four shillings) the whole; which will be an excellent payment for the ground they will have taken up. I do not, however, mean to extend this method to all my vineyards. In most of them, the soil, though fit for the vine, is too dry and stony for the poplar. In Italy, vines are frequently planted at the foot of mulberry and other trees. The only thing necessary in that case, is, to make the alleys of a breadth proportioned to the shade of the trees."

Experiment on the vine, cultivated according to the principles of the New Husbandry, with remarks thereupon, by M. de Chateaueux.

"When I began to reflect attentively on the principles of the New Husbandry, I soon perceived that it might prove a means of perfecting the culture of our vineyards, as well as that of our other lands.

"I was the more readily induced to turn my thoughts towards that important branch of agriculture, as it seemed to me to have been too much neglected for a long time. I plainly saw, that our methods of cultivating the vine, were, in general, not only defective, but badly executed, and that, in the common way of planting vineyards, the produce could not be proportioned to the great expence.

"I shall not at present enter into a detail of the principles and motives of my new scheme for the culture of the vine: that task would be too long for this narrative: and I should likewise be glad first to see the advantages of my method confirmed by a series of experiments repeated for several years, together. My different operations, and first success, are all that I shall mention now.

"Every country has in the culture of the vine, some practice or other peculiar to itself, and which is thought essential there, though it be rejected in other places. All agree in pruning the vine, and in stirring the earth round it: but neither of these operations is performed in the same manner every where.

"For the better understanding of my new culture, it is necessary that I should give an idea of the manner in which our vineyards are laid out and planted. Their exposition is generally to the east or south, on a good deep soil, which has a gentle declivity, or on the side of a hill. The whole surface of the ground is planted without order or symmetry; so that the vines are, almost always, either too close together, or too far asunder: very few are at proper distances. As the old vines decay and perish, the chasms are filled up by layers from the next neighbouring vines. This is the general disposition of our vineyards, from which great inconveniencies must necessarily arise: but I shall not enter into that detail.

"With regard to the culture of the vine, it is sufficient, for my present purpose, to observe, that the whole of that labour is now performed by hand, which renders it very expensive. I say nothing of the manner in which it is executed; that part having appeared to me so very defective, that I have been obliged to alter and correct it in every point.

"By this short preamble it may easily be seen, that, in order to improve the culture of the vine, and bring it

to greater perfection, it was necessary that I should attend chiefly to the three following things. 1. To dispose the vines in a better manner, by planting them in straight lines, and at equal distances from each other. 2. To contrive that disposition so as to lessen the present expence of culture, by using a plough to stir the ground in one part of the vineyard, whilst the other should continue to be stirred with the spade. 3. To execute the several cultures of the vine, in such manner as to make them promote its vegetation more than they do in any of the common methods.

"I shall treat each of these articles separately.

"The disposition which seemed to me the most agreeable to the principles of the New Husbandry, by which I was guided, was to lay the vineyard out in beds, as we do fields for corn, observing to leave an alley between every two beds, and making each bed five feet wide, in order to plant it with three rows of vines, which, by that means, would be thirty inches asunder, and the vines at the same distance from each other in the rows.

"As to the alleys, I thought it would be right to make them also five feet wide: and what I shall say hereafter will shew, that about that breadth is necessary.

"However, as that disposition might not be the best, I tried others on small spots of ground, by planting the vines at other distances. Some were set in single rows three feet and an half asunder; others in double rows, and in beds, with alleys of three feet and an half between them. These plantations, were made in the spring of 1753.

"But as I could not expect to see the event of these trials, till a considerable time after making them, eight or ten years, at least, being requisite to shew what the success would be, when the vines should be come to their full strength and bearing; I considered at the same time, by what means I might abridge an experiment which was to be of so long duration.

"To that end, I formed a bed of vines in a vineyard planted twenty-four years before. The vineyard was good, and yielded plentiful crops. I made my bed five feet wide, and planted it by laying down stocks of the old vines, to make the two outward rows, leaving two feet and an half distance from one layer to another. The old vines, which happened to be pretty well situated, formed the middle row. The remainder of the bed, which is two hundred and forty feet long, was planted with layers.

"An alley, five feet wide, was made on one side of this bed, by pulling up the old vines within that distance. Some of these which were left, served to form a row of vines, ready against the making of a second bed parallel to the first. It is plain, that the making of a bed in this manner, requires a breadth of ten feet, viz. five feet for the vines, and five feet for the alley. This bed was thus made in November 1752.

"After I had seen the crop which it produced in 1754, I no longer hesitated to extend this experiment; and accordingly, in November of that year, I made three other beds, like the former, and close to it.

"I not only made no doubt but that the vines, being so disposed, and having an equal quantity of earth to draw their nourishment from, would thrive better than they do in our common method of cultivating them; but I likewise hoped that their being exposed on all sides to the influences of the sun and air, by means of the alleys, would facilitate their vegetation, and hasten the ripening of the grapes.

"The manner in which I proposed distributing the vines, shews at once the possibility and facility of giving the alleys every necessary culture, with the same plough and the same cultivator as we use for the alleys of our corn fields. I have not found the least difficulty in the execution of this practice.

"The ground thus cultivated in the alleys, will be about a third part of the whole: the remaining two thirds will continue to be cultivated by hand, as usual; and the expence will be considerably diminished, by the

dispatch with which the plough, or cultivator, will perform its part.

"The plough may be brought as near the vines as one pleases, provided care be taken not to damage them. An expert husbandman will easily know how to manage in that respect.

"Another diminution of the expence attending the common culture of vineyards is, that as, by the method which I propose, the number of vines will be fewer, they will of course require less labour, and therefore less cost; and the vine-dressers, meeting with no hindrances or obstructions between the vines planted regularly in rows, will do more work in a day, and that much better, than in the old way. There will also be less occasion for many things necessary to the vine, such as propping, tying up, dunging, &c. Consequently this new culture will prove a considerable saving.

"It is well known how much vines are hurt when too great a quantity of water is retained in the ground. It chills them too much, their juices become less exalted, numbers of weeds spring up, &c. These inconveniences will be remedied in a great measure, by means of the alleys, by cutting with the plough, as I have done, towards the beginning of winter, a furrow along each side of the bed. The water will drain off into that furrow, and the bed will retain only the degree of moisture necessary for the vines.

"I shall speak only of the two principal parts of the culture of the vine, viz. the pruning of it, and the stirring of the ground; and the time when each of these ought to be performed.

"Before I began to execute the alterations I had thought of making in this culture, I had endeavoured to make myself so far master of it, as to be the less in danger of miscarrying in my experiment.

"The custom of this country is, to prune the vine during and after winter; frequently beginning that work about the end of January. I always thought that a wrong season; and judged that it would be much better to prune the vine before winter, immediately after the vintage is ended. Experience has since shewed me that I was right.

"In November 1750, I pruned above fifty vines with my own hands: none of them suffered in the least by the winter's frost: they made strong and vigorous shoots, and produced a greater quantity of grapes than any of the neighbouring vines.

"The next year, and in the same month, I pruned the same vines again. This pruning had the same success as the year before. Encouraged by this repeated experience, I determined to make the bed before mentioned, in my old vineyard. The vines have continued to be pruned before winter, always with success, and without any sort of inconvenience.

"Satisfied with these first trials, I thought I might safely venture to extend the same practice to a larger extent of ground. I had about three acres of vines, which had produced very little wood for two years past. Their branches were so poor and slender, that they would scarce bear laying down: in short, the vineyard perished daily. I conceived hopes of recovering it by means of this pruning. Accordingly, I pruned it in November 1754; and in 1755, the vines produced stronger and longer shoots. As the branches would then bear laying down, I began to replenish part of the vacant places. By this means, my vineyard was replanted with young vines, and quite renewed, only by altering the time of pruning.

"This last pruning underwent a severe trial, from the excessive hard frosts of the winter of 1755: yet, intense as the cold was, my plants bore it, without being hurt at all. I then looked upon it as certain, that the vine might be pruned before winter, without any danger from the inclemency of that season.

"It was absolutely necessary that the vine should bear pruning at that time, in order to enable me to perform the other cultures in their proper and most favourable seasons.

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"That the vine may be benefited as much as possible by every stirring of the earth about its roots, these stirrings ought certainly to be performed at the times when they may be most likely to excite the greatest vegetation. Let us see whether the common practice answers that end. The usual time of beginning to dress the vineyard is in the spring, immediately after pruning the vine, three dressings are judged sufficient; and it is generally thought, that the last should be finished by mid-summer. The plants are then left to shift for themselves, till the time of vintage, which is upwards of three months after. During this time, quantities of weeds generally shoot up, which shade the vines, and hinder the grapes from ripening as they ought. Careful husbandmen pull them up: but the greater part are unwilling to take that trouble.

"In the common way of cultivating the vine, the earth is first stirred when the buds are just ready to come out, and even after they are come out; a time always extremely critical, because the uncertainty of the season exposes the buds to several dangers, which are increased by that stirring of the earth, from whence many exhalations, oftentimes very pernicious, proceed at this season. Would it not be much better to let the vineyard rest while the vine is budding?

"The last stirring, which is given about mid-summer, is too long before the vintage, and therefore is almost always followed by great quantities of weeds. Might not this last culture be performed later?

"I have experienced that these inconveniences may be avoided, without falling into others. To this end, after the vine has been pruned, before winter, let the earth be first stirred in that season: the second stirring, which would otherwise be immediately after winter, may then be deferred till towards the end of May: and the third stirring may be given in the beginning of August, or about the end of July.

"This has been my method of cultivating my vines, ever since their being planted in beds. The beds are dug by hand, and the alleys are stirred with the plough or the cultivator.

"The first stirring before winter produces the same effect on the vineyards, as it does on our beds of corn. The water is drained off, and the winter's frosts penetrate the earth, divide it, and keep it loose and light.

"It remains in this state till towards the end of May, when it receives the first stirring after winter: and, to have a more certain rule to go by, the second stirring should not be given till after the props have been stuck, the vines have budded, and the shoots have been tied up to the props: This stirring may be given, either a little sooner, or a little later, than is mentioned above, according to the season. Sometimes one may be obliged to hasten it, if the ground is greatly burdened with weeds: but at whatever time it be performed near the end of May, it is certain that the vine will then have made great shoots, and that without having been disturbed by any stirring of the earth during the time of its tender vegetation. As I have tried this culture in hot and very dry years, I have seen that the earth has not grown hard, but has retained the necessary degree of moisture, so as to be stirred with the greatest ease.

"The third stirring, which is the second after winter, being deferred till towards the end of August, or at least till the end of July; weeds have not time to grow in any quantity between that and the season of the vintage: and what will render it still more beneficial, is, that this is the time when the grapes fall most, and are drawing towards a state of maturity.

"I may perhaps be thought not to enlarge enough on so important a subject as this is. It will, I confess, require being treated more fully hereafter: but in the mean time I beg the reader to consider, that I am now relating only the success of my first trials.

Good effects of this culture proved by the produce of a bed of vines two hundred and forty feet long, planted in 1752.

"I observed, in the beginning of this account, that every culture of the vine is performed with much greater

ease and expedition in vineyards laid out in beds, than in those which are planted all over; but at random. The very situation of the vines planted regularly in beds, is sufficient to shew with what ease every thing that they require may be done, and that they must, of course, be well cultivated in every respect.

"In the next place, the pruning of the vine, and the first stirring of the earth before winter, are done at a time when the business of the field is over, and husbandmen are, in some measure un-occupied. That time, which would otherwise be in a manner lost, may now be employed to very great advantage; and in consequence of their being advanced in their work before the coming on of winter, instead of being over-loaded in the spring, by a multitude of things to be done at that time, they will have ample leisure to attend properly, and without being hurried, to every branch of culture that a farm requires.

"The effect of our culture has been extremely visible. The new vines have grown so prodigiously, that they now greatly surpass those of the old vineyards, which they were part of: the shoots too are thicker and longer, and the bunches of grapes bigger and more numerous.

"When I first began to apply the principles of the New Husbandry to the culture of the vine, I hoped indeed that the great fruitfulness of a smaller number of plants, might compensate for the loss of those I was obliged to retrench: but I was agreeably surprised to find all the vines of my bed loaded with an equal quantity of grapes.

"Though my conjecture was founded on principles which I knew to be true, I was still further confirmed in my opinion by an observation I had made, that, even in our best vineyards, there are always great numbers of vines which absolutely bear no fruit at all, and many others which produce but very little; so that it is not on the great number of plants that the great produce of the vineyard depends, but on the goodness of those plants.

"Accordingly I concluded that I ought not to look upon my having taken up some vines in order to form the alley, as a loss, provided those in the bed were enabled by good culture to yield their utmost productions. The event shewed that I was right.

"I likewise judged, that the grapes would ripen more perfectly in this new way, than in the old: and in that too I was not mistaken; for they were much higher flavoured, and made far better wine.

"Besides these advantages, this culture preserved my vines from a very bad accident, which happens frequently, especially when the autumn is rainy: I mean, the rotting of the grapes. In our common vineyards, the grapes ripen, smothered beneath that quantity of leaves with which the vines are loaded, and surrounded by numbers of weeds, which often grow higher than the vines themselves. Add to this, that the air around them is filled with various exhalations from the earth, which, for want of a free circulation, remain suspended about the plants. These causes cannot but make the grapes rot, and the wine that is made of them, must be greatly inferior to what it would otherwise be.

"Our vines in beds, being much less, if at all, liable to any of these accidents, will have the advantage of preserving their grapes sound and without rottenness, till they are perfectly ripe. This I have already experienced, at a time when above half the grapes of my old vineyard were absolutely rotten.

Notwithstanding all the advantages of this new method, which, I may say, I have only glanced at, they would probably not be regarded, if they were not attended with greater fruitfulness than is obtained in the common way. I shall therefore shew, that the produce of my young vines was very considerable, and greatly superior to that of my old vineyard.

"My bed, as I observed before, was formed in November 1752; and the two outward rows consisted, in a great measure, of young layers, which not being old enough in 1753, to bear much fruit, I could not expect any great matter from them that year. However, they bore as much as could reasonably be desired. A violent storm

storm of hail which fell in June, left scarce any thing to be gathered in all our other vineyards.

"The year 1754 produced, in general, but little wine. The young plants of my bed, being then only in their second year, were too weak to distinguish themselves by any extraordinary quantity of fruit; though their vigour gave great hopes for future years. However, even in this, they were loaded with so many and so large bunches of grapes, that they yielded rather more wine than the old vines which were next them.

"The year 1755 was one of the best years for wine, that has been known for a long time. The quantity was plentiful, and the quality exceeding good. The youngest plants of my bed, which were only in their third year, seemed no way inferior to the old vines cultivated in the common way.

"This bed, two hundred and forty feet long, and ten feet wide, including the alley, yielded three hundred and thirty-six pints of wine, Paris measure (eighty-four English gallons), which was after the rate of two fifths more than I had from my old vineyard; or to explain myself still better, if my whole vineyard had been laid out in beds, it would have yielded five barrels of wine, for every three that it did yield.

"Twenty beds of the size of that we are speaking of, would make about an arpent; and supposing them all to produce alike, they would, after the rate of this, yield six thousand seven hundred and twenty Paris pints (one thousand six hundred and eighty English gallons), or twenty-eight hogheads; which, in this country (the territory of Geneva), is a prodigious quantity; such as no vineyard here has ever yet produced.

"The vintage of 1756 was neither plentiful nor good. I therefore did not make any comparison; but remained satisfied with observing in general, that my bed yielded at least as much as the old vineyard."

VINEYARD, a plantation of vines.

For the best situation of, and manner of planting, a vineyard, see the preceding article.

VIOLET, *Viola*, a genus of plants ranged by Linnæus among the *singenesia monogamia*, and of which there are nineteen species, but as many of them are natives of this country, and but few cultivated in the gardens, it is not necessary to describe them.

Culture of the VIOLET.

Violets may be propagated by seeds, which should be sown soon after they are ripe. In spring, when the plants are strong enough to be removed, they must be transplanted in shady borders, where they may stand till autumn, at which time they should be transplanted into the places in which they are designed to remain.

The common sorts of violets are easily propagated by parting of their roots, which may be done at Michaelmas. They should have a moist soil, and a shady situation.

Dame's VIOLET. See the article **ROCKET**.

Dog's VIOLET. See the article **DOG'S-TOOTH**.

VIORNA, a species of *Clematis*. See **CLEMATIS**.

VIPER'S BUGLOSS, *Echium*, a genus of plants ranged by Linnæus among the *pentandria monogynia*, and of which there are six species. 1. Viper's Bugloss with a shrubby stalk. 2. Viper's Bugloss with petals scarce exceeding the cup, and hairy borders. 3. Viper's Bugloss with a simple erect stalk, the stalk leaves spear-shaped and rough, and flowers in spikes proceeding from the sides of the stalks. 4. Viper's Bugloss with fruit-bearing cups, growing at a distance, and a trailing stalk. 5. Viper's Bugloss with a branching stalk, oval stalk leaves, and single side flowers. 6. Viper's Bugloss with petals longer than the stamina.

The first species is a shrubby plant, and a native of Ethiopia. The second grows naturally in this country, and in Italy. The third is a native of most parts of Europe. The fourth of Crete. The fifth of the East, and the sixth of the southern parts of Europe.

Culture of the Viper's Bugloss.

The fifth species is propagated by seeds, which should be sown in autumn, soon after they are ripe, in pots filled with light sandy earth. In October the pots must

be placed under a frame to protect them from the frost; but in mild weather they should be allowed plenty of free air. When the plants will bear removing, let them be planted each into a small pot, filled with light earth, and placed under a frame till they have taken new root, after which they must be gradually inured to the open air. In May let them be placed abroad in a sheltered situation, and in October removed into an airy glass-case.

The second and third species are propagated by seeds, which should be sown in the spring in a gravelly soil, or on the tops of old walls and buildings, where, when once the plants have established themselves, they will scatter their seeds, and thereby maintain a succession of plants without any farther trouble.

The fourth and fifth species are also propagated by seeds; when the plants come up, they will require no other care but to be kept clean from weeds, and thinned where they grow too close.

The sixth species is never cultivated in gardens.

VIPER'S GRASS. See the article *Viper's GRASS*.

VIRGIN'S BOWER, *Clematis*. See the article **CLEMATIS**.

VIRGINIAN SILK. See the article *Virginian SILK*.

UMBELLÆ, or **UMBELLS**, the round tufts or heads of certain plants set thick together, and all of the same height.

UMBELLIFEROUS PLANTS are such as have their tops branched and spread out like an umbrella; on each little subdivision of which there is growing a small flower; such are fennel, dill, &c. This flower is always pentapetalous, and is succeeded by two naked seeds adjoining to each other, which are, according to Ray, the true characteristics that distinguish these plants from others.

VOLKAMERIA, a genus of plants of which there are only two species. 1. Prickly Volkameria. 2. Smooth Volkameria. The first species is a native of the West Indies, and the second of both Indies.

Culture of the VOLKAMERIA.

These plants are propagated by cuttings, which, in May, June, or July, should be planted in pots, and plunged into a moderate hot bed, covering them close with hand glasses. When they have put out roots, they should be carefully separated, and each planted in a small pot, and plunged into a gentle hot-bed till they have taken fresh root, after which they may be inured to the open air. In winter these plants should be removed into a part of the stove where there is no great heat.

VOLVA is a sort of calyx consisting of a membranous matter surrounding the bases of many of the Fungi, or Mushroom tribe, and in many of them of a very singular figure and structure.



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WACHENDORFIA, a genus of plants of which there are only two species. 1. Wachendorfia with a simple stalk. 2. Wachendorfia with stalks which have many flower stems.

These plants are both natives of the Cape of Good Hope.

Culture of the WACHENDORFIA.

Both these species may be propagated either by seeds, or by off-sets from their roots; if by seeds, they should be procured from the Cape of Good Hope, unless some have ripened favourably in this country, which they seldom do. When the seeds arrive they must be sown in pots, and placed under a frame where they must remain

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all the winter. In spring the plants will appear, and when they are strong enough to remove, they should be each planted in a separate small pot, and may remain abroad till autumn, at which time the pots should be again placed under a frame.

If they are propagated by off-sets, they must be planted in separate pots, and after they have taken root, may be treated in the same manner as the seedlings.

WAKE ROBIN, See the article ARUM.

WALKERIA, a genus of plants of which there is only one species.

This plant is a native of the East Indies. The branches trail on the ground. The leaves are round, of a thick consistence, and a blueish colour. The flowers are of a bright blue colour.

Culture of the WALKERIA.

It is propagated by seeds, which must be sown in small pots, and plunged into a hot-bed, if the plants do not come up in time the pots must be removed to a second hot-bed, which will cause the seeds to vegetate.

When the plants come up, and are strong enough to remove, they should be planted into separate small pots, and plunged into a hot-bed of tanners bark, shading them till they have taken root again, after which they should have a large share of fresh air admitted to them, when the weather is warm, and be duly watered. The beginning of July they will flower and the seeds will ripen in autumn.

WALKS: those made of gravel, sand, or grass, are the most common in England; but where gravel or sand cannot be procured, they are sometimes laid with powdered coal, sea-coal, ashes, or powdered brick.

In order to the laying of gravel-walks, it is very proper that the bottoms of them are filled with some lime-rubbish, coarse gravel, flint-stones, or other rocky materials. This bottom must be laid eight or ten inches thick, over which the coat of gravel should be six or eight. The common allowance for a gravel-walk of five feet breadth, is an inch rise in the crown; so that if a walk be twenty feet wide, according to this proportion, it will be four inches higher in the middle than on each side; and a walk of twenty-five feet will be five inches; one of thirty feet six inches; and so on.

The best method of laying gravel-walks firm, is to give them three or four water-rollings; that is, they must be rolled when it rains so very fast, that the walks swim with water: this will cause the gravel to bind. Iron-mould gravel is the best for binding: or gravel with a little binding loam amongst it.

The best gravel for walks is such as abounds with smooth pebbles, which being mixed with a due proportion of loam, will bind very fast, and is never injured by wet or dry weather. The width of the walks must always be proportioned to their length, and the size of the garden. For farther particulars, see GRAVEL. For the method of laying out grass-walks in a garden, see GRASS.

Sand-walks are also frequently made in gardens, as being less expensive in the making and keeping than the former; for as the greatest part of the walks made in gardens are carried about in an irregular manner, it would be very difficult to keep them handsome if they were made of gravel; and as the walks are, for the most part, shaded with trees, so the dripping of the water from their branches in hard rains, would wash the gravel in holes, and render the walks very unsightly.

When the ground is traced out in the manner the walks are designed in, the earth should be taken out of the walks, and laid in the quarters. The depth of this should be proportioned to the nature of the soil; for where the ground is dry, the walks need not be elevated much above the quarters; so the earth should be taken out four or five inches deep in such places: but where the ground is wet, the bottom of the walks need not be more than two inches below the surface, that the walks may be raised so high as to throw off the wet into the quarters.

After the earth is taken out, the bottom of the walks should be laid with rubbish four or five inches thick, and

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beaten down as close as possible: then the sand should be laid on about three inches thick, and after treading it down it should be raked over, to level and smooth the surface: in doing of this, the whole should be laid a little rounding, to throw off the wet: but there will be no necessity of observing any exactness therein; for as the whole ground is to have as little appearance of art as possible, the grounding should appear natural, and only so contrived, as that the water may have free passage off.

WALLS, in gardening. Of all materials for building walls for fruit-trees, brick is the best: it being not only the handsomest, but the warmest and kindest for the ripening of fruit, and affording the best conveniency for nailing, as smaller nails will serve better in brick than it will in stone-walls, where the joints are larger; and if the walls are coped with free-stone, and stone pilasters, or columns at proper distances, to separate the trees, and break off the force of the wind, they are very beautiful, and the most profitable walls of any others; the bricks of some places are not of themselves substantial enough for walls, and therefore some persons, that they might have walls both substantial and wholesome, have built these double, the outside being of stone, and the inside of brick: but there must be great care taken to bind the bricks well into the stone, otherwise they are very apt to separate one from the other, especially when frost comes after much wet.

There have been several trials made of walls built in different forms; some of them having been built semi-circular; others in angles of various sizes, and projecting more towards the north, to screen off the cold winds: but there has not as yet been a method which has succeeded near so well as that of making the walls strait, and building them upright.

Those who build their walls substantially will find them answer much better than those which are slightly built, not only in duration, but in warmth: therefore a wall two bricks thick, will be found preferable to that of one brick and a half: and if in building of garden-walls they are grouted with soft mortar, to fill and close all the joints, the walls will be much stronger, and the air will not so easily penetrate, as it does through those which are commonly built.

For the aspect or situation of garden-walls, see the article EXPOSURE.

WALL-FLOWER, a species of Cheiranthus, or Stock July-Flower. See the article *Stock July-Flower*.

WALNUT-TREE, *Juglans*, a genus of plants ranged by Linnæus among the *monoecia polyandria*, and of which he distinguishes only three species. 1. Walnut-tree, with oval, smooth, sawed, and equal small leaves; or the common Walnut-tree. 2. Walnut-tree, with spear-shaped, sawed, small leaves, and the exterior ones larger; or the white Virginia Walnut, or Hickory Nut. 3. Walnut-tree, with spear-shaped, sawed, small leaves, and the exterior ones smaller; or the black Virginia Walnut.

Of the first species there are several varieties; viz. The large Walnut; the thin-shelled Walnut; the French Walnut; the late ripe Walnut; and the double Walnut.

But all of these vary when raised from seed, for which reason, such as plant these trees for their fruit, should make choice of them in the nurseries, when they are under fruit, that they may not be disappointed of such as they would chuse to have.

This tree is not only cultivated for its fruit, but also for its wood, which before mahogany was imported, was in universal esteem in England.

Culture of the WALNUT-TREE.

All the species and varieties are propagated by planting their nuts, which, if done in a nursery, the trees should be transplanted out, when they have had three or four years growth, to the places where they are designed to remain: for they do not bear transplanting when they are of a large size; therefore there may be a number of these trees planted, which need not be set at more than six feet apart, till they have produced fruit, at which time those which bear fruit of the kind that is desired,

may be left standing, and the other cut up, to allow them room to grow.

When the several sorts of this tree are propagated for timber, they should be sown in the places where they are to remain. The nuts should be preserved in their outer covers in dry sand till February, when they should be planted in lines, at the distance you intend them to stand: but in the rows they may be placed rather close, lest the nuts should not all succeed: and if they should, the young trees may be removed after they have stood two or three years, leaving the remainder at the distance they are to stand.

The best time for transplanting these trees, is as soon as the leaves begin to decay. The greatest care is requisite on this occasion: for neither the roots nor large branches must be pruned, and if these are preserved intire, there will be little danger of their succeeding.

The branches of these trees should never be pruned or lopped while they are growing, unless there is an immediate necessity for it, and then it should be done early in September, that the wound may heal before the cold increases, and they should always be cut off quite close to the trunk.

This tree thrives best in a rich loamy soil, or such as is inclinable to chalk, or marle, but it will likewise succeed tolerably well in stony ground. The trees should never be left at less than forty feet distance.

WALTHERIA, a genus of plants of which there are only two species. 1. Waltheria, with oblong, oval, sawed leaves. 2. Waltheria, with oval, sawed, veined leaves.

The first species is a native of both Indies. It rises with a shrubby stalk, covered with soft hairs, ten feet high. The leaves are hairy and soft, having several longitudinal veins. The flowers are small, yellow, and grow in clusters from the wings of the branches.

The second species is a native of Campeachy. The stalks are ligneous, rising six, and sometimes seven feet high, dividing into several branches. The leaves are oval, of a yellowish green colour, sawed on their edges, and hairy. The flowers are very small, yellow, and are collected into round clusters close to the wings of the leaves.

Culture of the WALKERIA.

These plants are propagated by seeds, which must be sown on a hot-bed, and when the plants are fit to remove they should be each transplanted into a separate small pot, and plunged into a fresh hot-bed, after which they must be removed into the bark-stove, and placed in the tan-bed, where they should always remain.

If these plants stand long without being disturbed, they will root in the tan-bed through the holes in the pots; therefore in summer the pots should be drawn out of the tan every six weeks; and the plants should always be new potted once in three months.

WATER: one of the most considerable requisites belonging to a garden; in the kitchen-garden it is absolutely necessary: for without it there cannot be much expected; therefore, in such places where a supply of water cannot be obtained for basons or ponds, wells must be dug; and if the depth of water should prove too great to be raised by pumps, there must be either machines for raising it contrived, or else it must be drawn by hand; but in such places where the water requires machines for raising it, there is very little encouragement to make a kitchen-garden: for the constant supplying of water in those dry situations, will be attended with great expence; and in general the produce of such land is very trifling, especially in a dry season.

When kitchen-gardens are supplied with water from wells, it is necessary to have large cisterns, into which the water should be put some time before it is used, and exposed to the sun and air: for the rawness of water, when fresh drawn from wells, is prejudicial to the growth of vegetables; therefore where large ponds are near these gardens, from whence the water can be led into them, it is by far the best for the growth of vegetables: next to this, river-water is esteemed the best, especially from those rivers which run through or near towns, where

the water is fattened by the soil thrown into the rivers.

When good water can be obtained in plenty from the neighbourhood of the kitchen-garden, there should be two or three basons made in different parts of it, and so contrived that no part of the garden should be too far distant from the water: for when the water is to be carried to a considerable distance, the expence of labour will be great, and there will likewise be much danger of the plants suffering from their being too sparingly watered.

The size of the basons should be proportioned to the quantity of water which will be required, or that they can be supplied with; their depth should not be more than four feet, for if they are made deeper, the water is not so well warmed and tempered by the sun and air: for which reasons the water of shallow basons is much the best for the use of gardens. For the manner of making basons, see the article **BASON**.

WATER-GERMANDER. See the article *Tree GERMANDER*.

WATER-LILY. See *Water LILY*.

WATER-PARSNEP. See the article *Water PARSNEP*.

WATSONIA, a genus of plants of which there are only two species. 1. Watsonia, with sword-shaped leaves, and flowers placed alternately on the stalks. 2. Watsonia, with sword-shaped leaves, and flowers disposed in a loose spike.

These species are natives of the Cape of Good Hope. The root of the first species is bulbous, and shaped like a kidney, covered with a fibrous brown skin. The leaves are sword-shaped, about a foot long, and an inch broad, ending in points; the two sides have sharp edges: they are of a dark green, and rise from the root. The stalks grow out from the root between the leaves, and rise to the height of a foot and a half. The flowers are produced from the side, at about an inch and a half distance from each other; they are of a red copper colour on the outside, but of a deeper red within.

The second species is much less than the first; the leaves are shorter and not so broad; the flower-stalk is seldom more than a foot high; the flowers are ranged closer upon the stalk, and they are of a deeper red.

Culture of the WATSONIA.

These plants are propagated by off-sets from the root; the best time for transplanting of the roots is in August, soon after the stalks decay; the larger roots must be each put into a separate pot filled with fresh light earth, and placed in the open air till the end of October, when the leaves will begin to appear above ground, at which time the pots must be plunged into an old bed of tanners-bark, which has lost its heat; the bed must be covered with a frame, and the glasses drawn off every day in mild weather, that they may have as much free air as possible, to prevent them from drawing up weak; but they must be covered in bad weather. Towards the end of April, when they begin to put out their flower-stalks, the pots must be removed into an airy glass-case, where they may stand to flower; and when the flowers are decayed, they should be placed in the open air to perfect their seeds.

The off-sets and small roots may be planted three or four in a pot, according to their size, and require the same treatment as the larger roots the first year, and by that time twelvemonth they will be strong enough to flower, so must have separate pots.

WHIN. See the article **FURZE**.

Petty WHIN. See the article **REST-HARROW**.

Petty WHIN, a species of Broom. See **BROOM**.

WIDOW-WAIL, *Cneorum*, a genus of plants ranged by Linnæus among the *triandria monogynia*, and of which there is only one species.

This is an humble shrub, which grows naturally in France and Spain, and seldom rises more than two feet and a half in this country, but spreads out on every side with many lateral branches, so as to form a thick bush. The flowers begin to appear in May, and are succeeded by others during the summer months: it is an evergreen shrub, and so may be very ornamental in the front of plantations of evergreen trees and shrubs.

W I L

Culture of the WIDOW-WAIL.

It is propagated by seeds, which should be sown in the autumn soon after they are ripe, and then the plants will come up the following spring; whereas those which are sown in the spring will remain a year in the ground, and often miscarry.

These seeds may be sown on a bed of common earth, covering them half an inch deep. The summer following they will require no other care, than that of keeping the plants clear from weeds; and the next autumn they may be transplanted where they are designed to remain.

WILDERNESS, in gardening, a kind of grove of large trees, in a spacious garden, in which the walks are commonly made either to intersect each other in angles, or have the appearance of meanders and labyrinths. See the articles *Grove* and *Labyrinth*.

According to Mr. Miller wildernesses should always be proportioned to the extent of the gardens in which they are made; for it is very ridiculous to see a large wilderness planted with tall trees in a small spot of ground; and on the other hand, nothing can be more absurd, than to see little paltry squares, or quarters of wilderness-work, in a magnificent large garden.

The situation of a wilderness should never be too near the habitation, nor so as to obstruct any distant prospect of the country; there being nothing so agreeable as an unconfined prospect; but where, from the situation of the place, the sight is confined within the limits of the garden, nothing can so agreeably terminate the prospect, as a beautiful scene of the various kinds of trees judiciously planted; and if it is so contrived, that the termination is planted irregular, with the concave towards the sight, it will have a much better effect, than if it end in straight lines or angles.

The plants should always be adapted to the size of the plantation; for it is very absurd for tall trees to be planted in the small squares of a little garden; and in large designs small shrubs will have a mean appearance. It should also be observed, never to plant evergreens amongst deciduous trees; but always to place the evergreens in a wilderness in a separate part by themselves, and that chiefly in sight.

As to the walks, those that have the appearance of meanders, where the eye cannot discover more than twenty or thirty yards in length, are generally preferable to all others, and these should now and then lead into an open circular piece of grass, in the center of which may be placed either an obelisk, statue, or fountain; and if in the middle of the wilderness there be contrived a large opening, in the center of which may be erected a dome or banquetting-house, surrounded with a green plat of grass, it will be a great addition to the beauty of the whole.

From the sides of the walks and openings, the trees should rise gradually one above another to the middle of the quarters, where should always be planted the largest growing trees, so that the heads of all trees may appear to view, while their stems will be hid from the sight. Thus in those parts which are planted with deciduous trees, roses, honey-suckles, and other kinds of low-flowering shrubs, may be planted next the walks and openings; and at their feet, near the sides of the walk, may be planted primroses, violets, daffodils, &c. not in a straight line, but so as to appear accidental, as in a natural wood.

Behind the first row of shrubs should be planted syringas, and other flowering shrubs of a middle growth; and these may be backed with many other sorts of trees, rising gradually to the middle of the quarters.

The part planted with evergreens may be disposed in the following manner, viz. in the first line next the great walks, may be placed the laurustines, boxes, spurge-laurel, juniper, savin, and other dwarf evergreens. Behind these may be planted laurels, hollies, arbutuses, and other ever-greens of a larger growth. Next to these may be planted, yews, cypresses, Virginia cedars, and other trees of the same growth; behind these

W O O

may be planted Norway and silver firs, the true pine, and other sorts of the fir growth; and in the middle should be planted Scotch-pines, pinaster, and other, of the large growing ever-greens, which will afford a most delightful prospect, if the different shades of the greens are curiously intermixed.

And besides the grand walks and other openings, there should be some smaller serpentine-walks through the middle of the quarters, where persons may retire for privacy; and by the sides of these private walks may also be scattered some wood-flowers and plants, which if artfully planted, will have a very good effect, the grand walks should always be laid with turf and kept well mowed.

Great care must be taken that there does not appear a studied and stiff correspondency between the several parts; for the greater variety there is in the distribution of these, the more pleasure they will afford.

WILLOW-TREE, *Salix*, a genus of plants ranged by Linnæus among the *dioecia diandria*, and of which he distinguishes twenty-nine species which are too numerous to be described here, especially as many of them, growing naturally in the northern parts of Europe, are low, creeping shrubs, of no use; and as one sort of culture will do for such species as are planted for service.

Culture of the WILLOW-TREE.

The several different species of Willow raised in this country may be easily propagated by planting cuttings or sets, either in the spring or autumn, upon moist boggy soils, where few other things will thrive.

WILLOW-HERB or *French Willow*. *Epilobium*, a genus of plants ranged by Linnæus among the *octandria monogynia*, and of which there are seven species, most of them natives of this country, but two only are cultivated, viz. 1. Willow-Herb with spear-shaped narrow leaves, thinly scattered on the branches. 2. Willow-Herb, with opposite spear-shaped sawed leaves, commonly called codlins and cream.

Both these are perennial plants; and natives of this and most other countries of Europe.

Culture of the WILLOW-HERB.

They are easily propagated by their creeping roots, and will grow in any soil or situation.

WIND-FLOWER. See the article *Wind Flower*.

WINGS, *Alæ*. See the article *ALÆ*.

WINTER-ACONITE, a species of Black Hellebone. See the article *Black HELLEBORE*.

WINTER-CHERRY. See *Winter CHERRY*.

WINTER-GREEN, *Pyrola*, a genus of plants of which there are four species. 1. Winter green with rising stamina, and a declining pointal. 2. Winter green with a bunch of flowers ranged on one side the footstalk. 3. Winter green with one flower on the stalk. 4. Winter-green with two flowers on a foot-stalk.

The first species grows wild in many parts of this country. The second species grows naturally upon the mountains in Italy, particularly near Verona and Genoa. The third species grows naturally in shady woods in the northern parts of Europe; and the fourth is a native of North America.

Culture of the WINTER-GREEN.

It is propagated by planting the roots, about Michaelmas, in a shady situation, and on a moist undunged soil, where they should be frequently watered in dry weather, otherwise they will not thrive. Some of these may be planted in pots, which must be filled with a mossy moorish soil, and placed in a shady situation, where, if they are constantly watered in dry weather, they will thrive very well.

WITCH-HAZEL. See the article *Witch-HAZEL*.

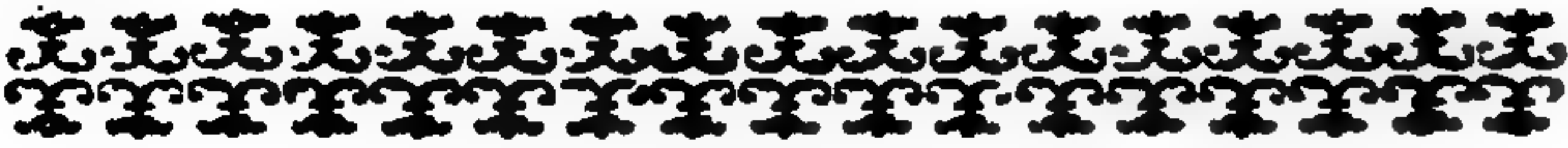
WOLF'S BANE. See *ACONITE*.

WOODBINE, a species of Honey-suckle. See the article *HONEYSUCKLE*.

WOOD-SORREL. See *Wood SORREL*.

WOOD-WAXEN, a species of Broom. See the article *BROOM*.

XIMENIA,



X.

XIMENIA, a genus of plants of which there are only two species. 1. *Ximonia*, with single leaves. 2. *Ximonia*, with twin leaves.

The first species is a native of the islands in the West Indies. The second grows naturally in Egypt, where it becomes a tree of middling size.

Culture of the XIMENIA.

Both these species are propagated by seeds, which must be had from the countries where they are natives; these must be sown in pots filled with light earth, and plunged into a hot-bed of tanners-bark. When the plants are about three inches high, they must be each transplanted into separate small pots filled with light earth, and plunged into a hot-bed of tanners-bark, and shaded from the sun till they have taken new root. During the first summer they may be kept in the tan-bed under frames, where they will thrive much better than in the stove; but in the autumn, when the nights grow cool, they must be removed into the stove, and plunged into the tan-bed, in which they should be kept, observing to shift them into larger pots when they require it; and in summer, when the season is warm, they must have a large share of free air admitted to them.

XIPHION, or **XIPHIMUM**, a species of Iris. See the article **IRIS**.

XYLOSTELUM, a species of Honeyfuckle. See the article **HONEYFUCKLE**.



Y.

YARROW. See the article **ACHILLÆA**.

YEW-TREE, *Taxus*, a genus of plants ranged by Linnæus among the *diœcia monadelphia*, and of which there are only two species. 1. Yew-tree, with leaves growing near each other; or the common Yew. 2. Yew-tree, with leaves growing at a distance from one another.

The first species is a native of most parts of Europe; and the second grows naturally in Japan, but is never cultivated in the English gardens.

Culture of the YEW-TREE.

It is easily propagated by sowing the berries in autumn, as soon as they are ripe, upon a shady bed of fresh, undunged soil, covering them over about half an inch with the same earth. In the spring the bed should be carefully cleared from weeds, and if the season proves dry, it should be now and then refreshed with water.

When the plants come up, let them be always kept clean from weeds; and when they have remained two years upon this bed, they should be transplanted about the beginning of October into beds of fresh, undunged soil, about four or five feet wide, and planted in rows about one foot asunder, and six inches distance from each other in the rows; the surface of the ground about their roots should be covered with some mulch: they should be watered in dry weather, and kept clear from weeds in summer, trimming them according to the purpose they are designed for.

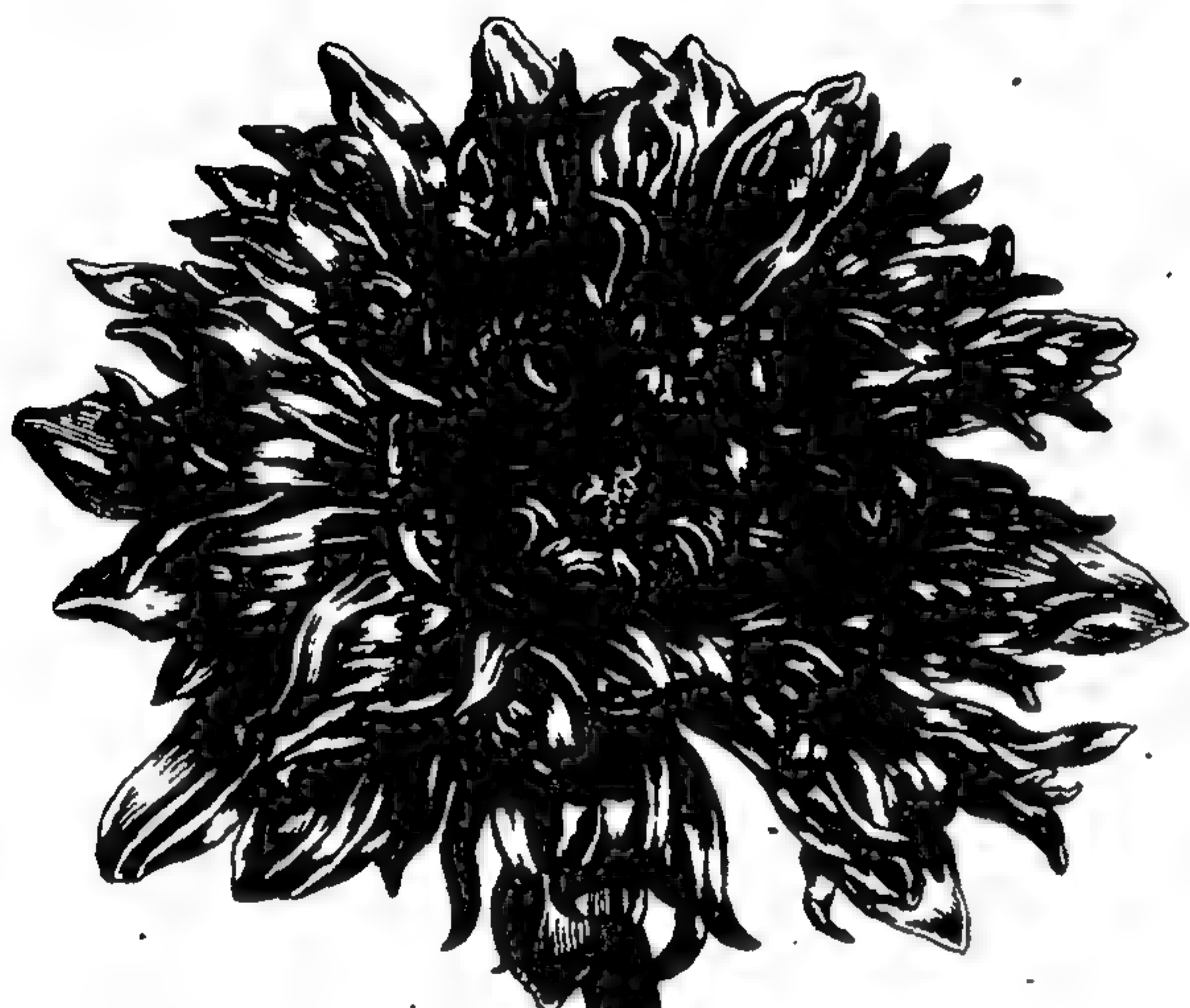
In these beds let them remain two or three years, according to their growth: then they should be removed in autumn into a nursery, and planted in rows at three feet distance, and eighteen inches asunder in the rows. In the summer season they should still be trimmed, and after they have continued here two or three years, they may be transplanted to the places in which they are designed to remain.



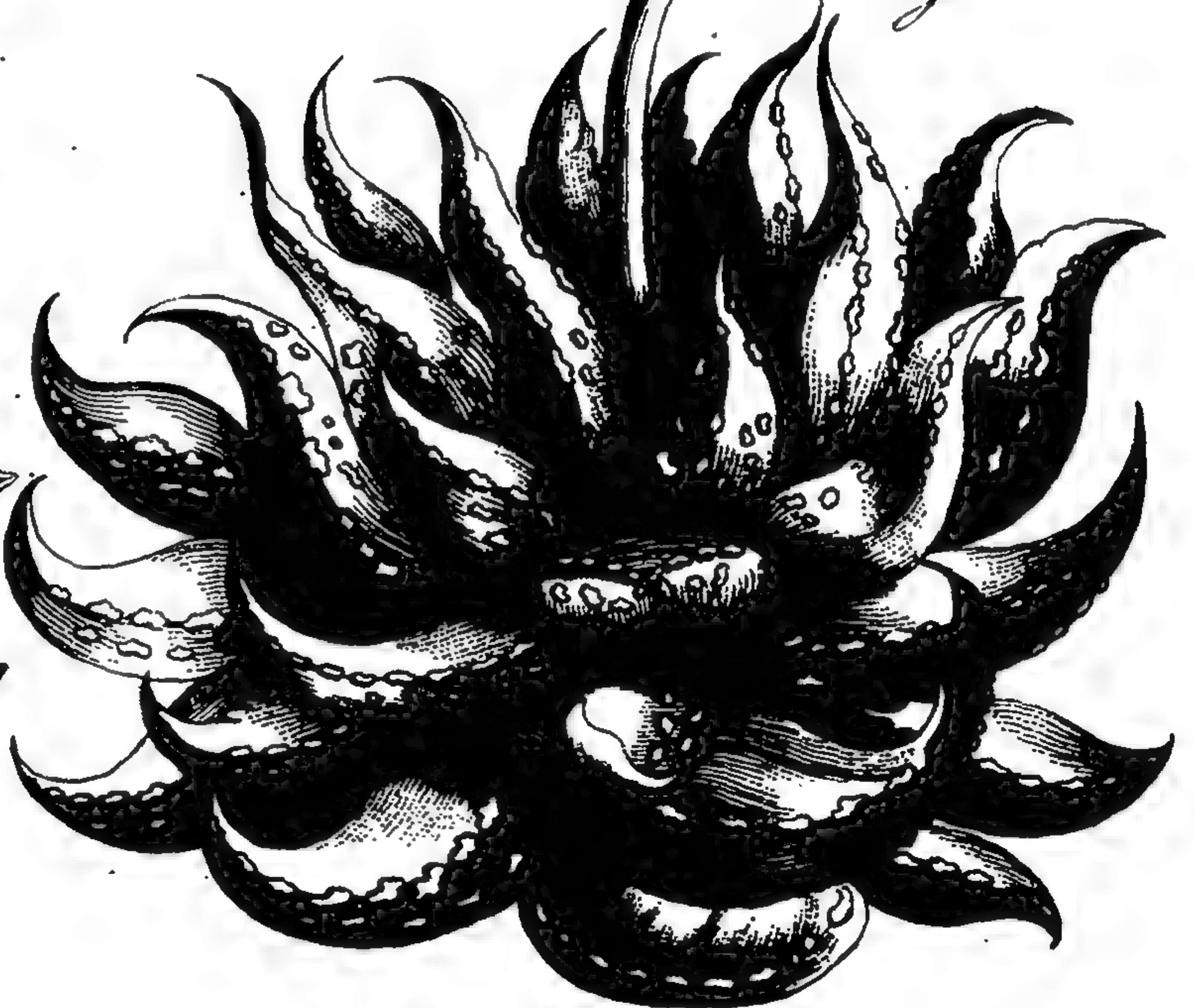
Z.

ZERUMBET, a species of Ginger. See the article **GINGER**.

F I N I S.



*Great Chalcedonian
Anemone?*



Pearl Aloe?



Fig 5
Double China
Aster



Fig 4
Early Shrub
Anon



Fig 7
Beureria



Fig 6
Purple Auricula

Engraved for Dick's Dictionary of Gardening



Fig. 8
The Bee Flower



Fig. 9.
Velvet Bindweed



Fig. 10
Double Blossomed
Bramble



*Fig. 11.
Bixa ?*



*Fig. 13.
Quadrifoliate Bignonia.*



*Fig. 12.
Oriental Betony.*

Engraved for Dick's Gardeners Dictionary.



Fig. 14.
Double Starry Columbine

Fig. 15.
Long Spiked Cytisus

Fig. 16.
Double White Crowfoot

Engraved for Dick's Gardeners Dictionary.



Fig 17
Spotted Cistus



Fig 18
Purple Portulaca

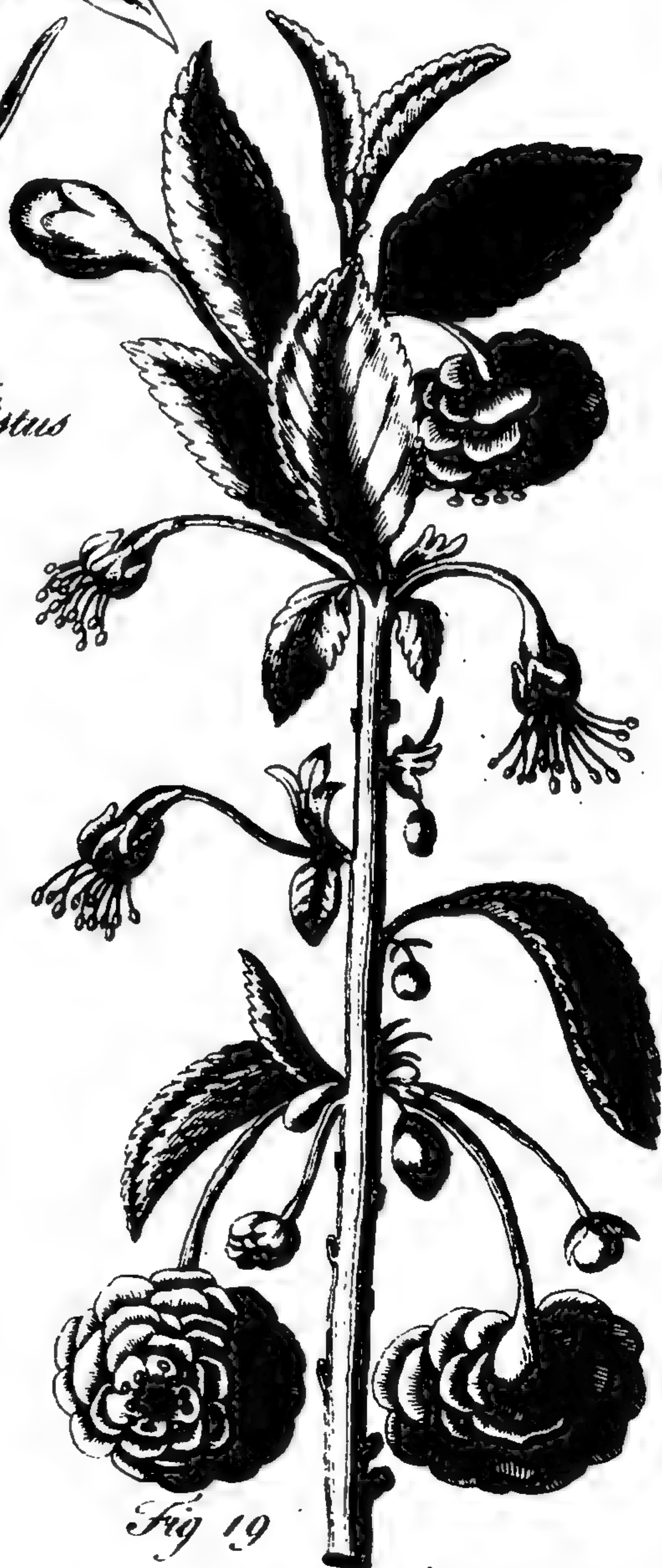


Fig 19
Double Blossomed Cherry

Engraved for Dicks's Gardeners Dictionary.



Fig. 20.
(Cotton Tree)



Fig. 21.
Great Flake Carnation?



Fig. 22.
Great Bizarre Carnation?

Engraved for Vick's Gardeners Dictionary.



Fig. 25.
Egg Plant



Fig. 23.
Candy Chrysanthemum



Fig. 24.
Proliferous Noddy



Fig. 26
Broad leaved Cluster Frutillary.

Fig. 28
Oval leaved
Rose Hibiscus.

Fig. 27
Vine-leaved
Geranium.

Engraved for *Dickens's Gardeners' Dictionary*.



Fig. 28.

The Polyanthous Primrose?



Fig. 29.

Harwell of Peru?



Fig. 30.

Tree Mint

Fig. 31.

The Cluster Tulip.



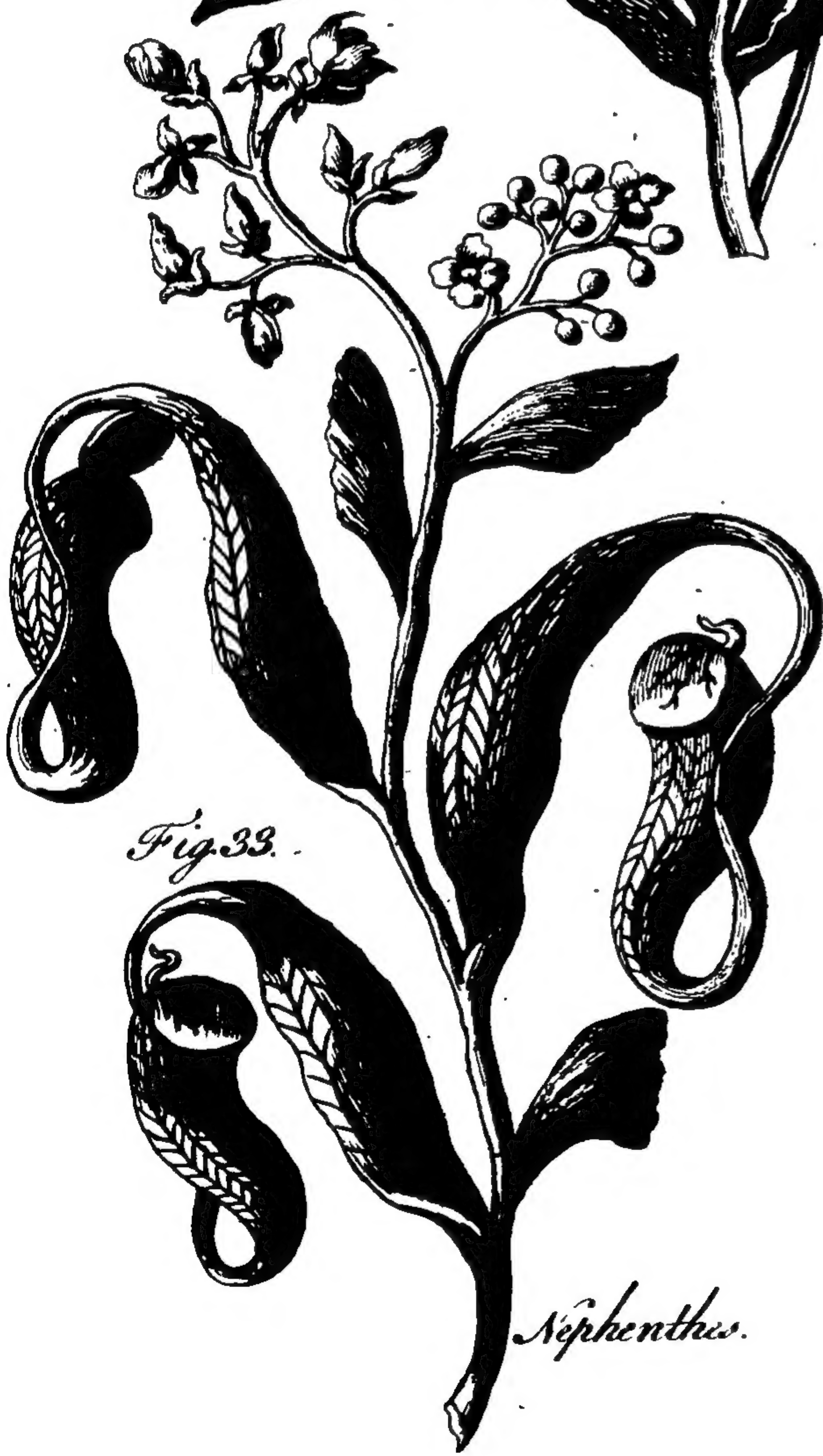
Fig. 32.



Spotted Phlox.

Fig. 33.

Nepenthes.





The Sensitive Plant.



many Spiked Sparrowhawk.



Violet Selfheal.



Double Frachelium.



Purple Shrub Trefoil.



Corymbose lobated Spirea.